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ORIGINAL LECTURES.

CÆSAREAN SECTION FOR CANCER OF THE CERVIX.

A Clinical Lecture delivered at the Hospital of the University of Pennsylvania, March 13, 1889.

BY WILLIAM GOODELL, M.D.,
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GENTLEMEN: I shall to-day perform the operation of Cæsarean section before you, and as I shall not be able to talk much during the operation, I shall say what I have to say while the patient is being etherized.

I am emboldened to do this operation before you for this reason: At the beginning of our course, six months ago, I took a new departure, and up to the present time my son and I have performed abdominal section twenty-three times, either in this amphitheatre or before the ward classes. Of this number we have lost only one from septicæmia, and in that case death was almost a foregone conclusion. It was a desperate case, with rotten pus in both tubes and both ovaries, which were universally adherent and could not be wholly removed. We have had one death from shock in a case of large sarcoma of the womb, removed by supra-vaginal hysterectomy. We have had a third death, but not, however, from the operation. If in this case I had made a complete diagnosis, perhaps I would not have operated. She had mental hebetude, very marked loss of memory, a hesitating speech, and many nerve-symptoms which I thought were hysterical, but which were really due to some obscure cerebro-spinal lesion. She had severe groin-aches and painful locomotion, which were, and I think correctly, referred to very marked disease of the uterine appendages. I removed the ovaries and tubes, which were enlarged, adherent, and contained pus. The patient recovered from the operation, and did very well for over two weeks, then paresis set in, followed by loss of control over the sphincters, and she died in the fourth week. An autopsy was not permitted, and I am therefore left in doubt as to the character of the brain lesion, but I think it was the result of specific disease. These are all the fatal cases that we have had, and only one can be laid to blood-poisoning.

The patient on whom I shall operate to-day is a white woman, aged thirty-two years. She married when a little over fourteen years of age, and has had eight children and four miscarriages, the last one of twins. In February of last year she found that she was losing blood per vaginam, but neglected to have anything done until some months later. When she came under observation, it was found that she had advanced cancer of the cervix. This was curetted and burned with the actual cautery by my son in October last. Since then the hemorrhages have ceased until very recently. At the time of the curetting she was pregnant. but the condition escaped recognition until two weeks later, when the movements of the child were felt by her. We have had to depend upon the sign of quickening in determining the age of the fœtus, and, according to my calculation, it is within two weeks of the full nine months; but this is a rough and untrustworthy datum.

This operation is necessary because the cervix is hardened and thickened by dense masses of cancer, and is firmly fused to bladder and rectum. In all probability it would be impossible for the cervix to dilate sufficiently to allow the passage of a living child. The result would undoubtedly be death to the child and death to the mother. So we are driven to the operation to save the life of the child and to prolong that of the mother.

I think it wisest to do the operation before the period of gestation is fully completed, for then we can choose our own time, and besides that, her hemorrhages have started up again, which will weaken her. The only objection is, that the canalization of the cervix caused by labor has not, of course, taken place. It is important that the cervical canal should be somewhat dilated, in order to afford an avenue of escape for the lochial discharges. After completing the operation, I shall do this artificially, using, if necessary, my uterine dilators.

According to my diagnosis, we have here a breech presentation with the back of the child to the right. I hear the fœtal heart sounds very plainly on the right side. I do not understand how it is that I hear them so distinctly with the right side of the child uppermost.

The patient has shown a good deal of pluck in looking forward to this operation. This is mainly due to the fact that she has been in the hospital for a couple of months, and has had an opportunity of seeing a number of cases of abdominal section for large tumors followed by recovery. She has made one stipulation, that I should baptize the child as soon as it is born. I wish to say one word here in this relation: Always respect the religious tenets of your patients, no matter what your own may be. So I make it an inflexible rule to ask a woman in labor, whom I may be attending, whether she wishes me to baptize the infant if its life is in danger, and I always accede to her wishes. Our patient has given me two names. If it turns out a boy, it is to be named Owen; if a girl, Sarah Agnes.

What are the statistics of this operation? The old Cæsarean section was a very dangerous operation, the great majority of cases perishing. This was largely due to the fact that the operation was delayed too long, until time, ergot, and the forceps had been tried. When antisepsis was used, and the operation was undertaken a short time after labor set in, the results were better, although the mortality still remained very high until Sänger, of Leipsic, suggested a method of operating, since which the success has been marvellously improved. Dr. Harris, who has honored us by his presence to-day, and who is one of our most accurate and

best statisticians, tells me that there have been performed 163 cases of the Sänger operation, with 45 deaths. In this country the statistics are not so favorable, there having been 26 cases with 16 deaths. One reason that the Sänger operation is more successful than the old Cæsarean section, is because two sets of sutures are put in, bringing the uterine walls and the edges of the peritoneum into close contact. This formerly was not done. Another reason for the present success is, that we now recognize the great importance of aseptic and antiseptic precautions. In closing the incision through the uterine wall I shall employ two sets of sutures. First, a set of deep sutures introduced about half an inch from the edge of the wound and passing down to the mucosa but not penetrating it. The object of not going through the mucous membrane is of course to avoid the passage of septic material from the uterine cavity to the peritoneal cavity through the suture opening. In tying the deep sutures I shall take care to invert the serous covering of the uterus so as to secure close coaptation. This will also be favored by the second set of stitches consisting of the Lembert suture superficially applied. In this way we get that perfect union which is essential to success.

We have prepared the patient and instruments with scrupulous care to avoid the introduction of septic matter, and I shall now proceed with the operation, making an incision from above the umbilicus to near the pubes, controlling hemorrhage by hemostatic forceps. I next open the peritoneum and at once come upon the uterus. There are two ways by which we may now proceed. In the first place, we may open the uterus *in situ*, the abdominal walls being closely pressed against the uterus to prevent the entrance of fluids into the peritoneal cavity. The child is then removed and the uterus brought through the abdominal incision. In the second method, the uterus is brought through the abdominal wound and then opened outside of the body. I shall adopt the former plan as it will not need so long an abdominal incision.

The uterus was then opened, an incision of about five inches being made. The escape of the liquor amnii was accompanied by the protrusion of the right arm of the child, which, as had been diagnosticated, presented by the breech. The head was in the left hypochondriac region and the back of the child toward the right. The head was brought to the uterine opening and delivered, the rest of the body following without difficulty. The cord was compressed with hemostatic forceps and cut. The child (a male) was then given to Dr. Barton Cooke Hirst and in a few minutes was crying lustily.

The uterus was next brought outside of the abdomen and the peritoneal cavity packed with sponges. The left ovary and tube were seen attached to the uterus. A rubber tube was secured around the cervix and the placenta gently detached and removed. A sponge was placed temporarily in the uterine cavity and the deep sutures, fourteen in number, inserted. The sponge was then removed and the deep sutures tied. The superficial sutures, consisting of seventeen Lembert sutures, were passed through the peritoneal coat. As a precautionary measure the peritoneal cavity was irrigated with warm boiled water. The abdominal incision was then closed in the ordinary manner, the umbilicus being excised to facilitate approximation of the wound, and sufficient of the tendon was included in the sutures to insure a firm cicatrix. The wound was dressed with fifty per cent. iodoform gauze, over which were placed ordinary gauze and cotton which had been baked in an oven.

Dr. Goodell then continued: You might ask me why I did not do a Porro operation. The Porro operation is somewhat less successful than the Sänger, and as the ordinary Porro is nothing more than a supra-vaginal hysterectomy, it would not have removed the diseased tissue. If there had been any possibility of removing all of the cancer by hysterectomy, I should have performed this operation in preference to the Sänger operation. The disease is, however, so extensive, both the bladder and rectum being involved although not yet perforated, and the tissues are so matted together, that there would have been no possibility of accomplishing a radical cure.

In this case we employed chloroform as the anæsthetic, for when we have pressure on the respiratory organs and kidneys, by a tumor of any kind—and the pregnant womb is a tumor—I prefer to use chloroform. I use it altogether in the laparotomies at my private hospital. The apparatus which I employ is a very safe one, as the patient gets only a minim of chloroform at each compression of the bellows. Sometimes after the administration of ether, the kidneys becoming acutely congested refuse to work and I have had patients die from uræmic coma from suppression of the urine. Then again I have seen fatal œdema of the lungs follow its use in old people. Chloroform does not have such an injurious effect upon the kidneys or the lungs. Whenever albumin is found in the urine, no matter what the operation, I should always give chloroform in preference to ether. Also in the aged I should prefer the former anæsthetic.

I shall next pass my finger into the vagina and determine the condition of the cervix. The easiest plan would have been to open the cervix from above, but I feared that my finger would become contaminated by the cancerous juices, although the vagina had been thoroughly syringed with a 1 : 1000 corrosive sublimate solution. I find, however, that, owing to the curetting performed by my son, the finger readily enters the cervical canal so that there is a free avenue for the escape of the lochia.

I sincerely trust that this patient will recover. She deserves it, she has plenty of pluck, she is in as good a condition as a person with a cancer can be, and I think that the operation was performed under strict antisepsis. The only criticism that I have to make is in regard to the delivery of the child by the head. Delivery was accomplished more quickly in that way, but I might have been able to get the child out through a smaller opening had I turned and delivered by the feet. This, however, would have compelled the introduction of the whole hand deeply into the lower segment of the womb, where the breech lay, so I seized that portion of the body which was handiest.

To insure contraction of the womb, after the lecture was over a hypodermatic syringeful of fluid extract of ergot was injected into the thigh on its outer aspect.

NOTE.—*March 26th.* To-day, the thirteenth after the operation, this woman appears virtually out of danger. She eats and sleeps well, and has a full breast of milk. The infant is also thriving.

ORIGINAL ARTICLES.

ELECTRICITY AS A THERAPEUTIC AGENT.[1]

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IN the management of a business concern the results of taking account of stock and of balancing the books is rightly considered of supreme importance. Perhaps it might be of advantage to us as practitioners if the results of our work could be occasionally reckoned up in a similar manner, and a definite estimate made of the value of our methods. It is in pursuance of this idea that electricity as a therapeutic agent is brought before you for discussion to-night. Over a hundred years ago it was introduced into medical practice. Since that time it has met with varying degrees of favor. Twenty years since, under the impetus of German influence, its use in nervous affections was firmly established. Yet recent writings and text-books on the medical use of electricity show a disregard of recent advances in the knowledge of the physics of this agent. And it needs very little study to convince one that the modern view of electricity differs widely from the older views reproduced in medical literature. To follow them closely would lead one to consider electricity as an entity, possibly a fluid, which can be administered like a drug. The term "current" is partly responsible for this fallacy, it being difficult to deal with this term without imagining a flow of something in a definite direction. Yet just as the older term caloric is now discarded, and the old notion that "heat is the result of caloric being poured into a body" raises a smile, so similar fallacious notions regarding electricity should at present meet with disapproval.

The sooner it is realized that electricity, like heat and light, is merely a form of activity in matter, and the sooner the term "electrical currents" gives place to the more accurate phrase *state of electrification*, the sooner will the mystery surrounding this agent be cleared away.

When electricity is applied to the body a change is produced in the normal condition of the molecules making up the body, a new molecular condition is produced, but nothing is added to or subtracted from the body itself.

Between the two poles of the battery this molecular state is more intense than elsewhere, and under one pole it is somewhat different from that under the other. The intensity of the change is measured roughly in terms of the strength of its pull upon a balanced needle—but this should not lead to the adoption of such terms as a dosage of electricity, which, like the term current, is sure to mislead.

When electricity is thus regarded as a mode of energy capable of estimation, like other modes, in terms of work, it becomes evident that a valuation of the various forms under which this energy appears is possible.

In common usage these forms are static or frictional electricity, voltaic electricity or galvanism, and induced electricity or faradism. It should be distinctly understood that all these forms are really the same mode of energy displayed under varying conditions. An illustration may make this plain. Suppose that you have a dry sponge and a tumbler of water. If you throw the water over the sponge the greater part of it will run off, leaving only the surface of the sponge wet. You have applied a quantity at once, and your effect is short and soon over. Suppose, on the other hand, you let the water fall on the sponge drop by drop. It will soak in and wet it thoroughly but gradually, until in the end all the water will remain in the sponge, which is now soaking. The effect is slow but intense. Water and sponge are the same in both cases. The conditions vary under which they are brought together.

This illustration, which is not to be taken literally, may convey some notion of the difference between static and voltaic electricity. By the former sudden transient effects are produced very limited in intensity. By the latter, slow permanent effects are produced of much intensity.

I. STATIC ELECTRICITY.—It seems strange, when the history of the uses of electricity is reviewed, to find how much credence is still placed in the effects of frictional electricity. In the first place, the change of electrical state produced by it is limited exclusively to the surface of bodies charged. Take a metal ball insulated by a glass stand over which two hemispheres are fitted, and charge this with static electricity. If the hemispheres be now removed from the surface, they are found to carry all the electrical charge, and no change of electrical state has been produced in the metal ball beneath them. There is absolutely no proof that the human body acts in any way differently from the metal ball. Any effects obtained by static electricity must, therefore, be from surface stimulation; and, hence, wholly reflex and indirect in character. For this form of electricity does not penetrate the skin.

When the surface of a body is charged with static electricity, it discharges itself gradually into the air by diffusion, or directly into the ground if the body be not insulated. The human body cannot be permanently charged with electricity. The state of electrification on the surface of the body is communicated to the air about, which is thus put in a similar electrical state. But bodies in a like state

[1] Read before the New York Academy of Medicine, March 21, 1889.

of electrification repel one another. Hence the hair, when charged, is repelled from the body, and stands on end; air, when charged by diffusion, moves away from the body, and the air in motion is felt as a breeze; hence, when a person is charged with static electricity this breeze may be felt. There is no more virtue or curative property in an electrical breeze than in any ordinary draught of air. Hence, it is ludicrous to read of the beneficial effects ascribed to the electrical breeze.

If all effects of static electricity are reflex in their nature, due to irritation of the skin, then the agent differs in no respect from any mild form of counter-irritation—such as whipping with twigs, lomi lomi of the Sandwich Islanders, the needle douche of a Turkish bath—excepting, possibly, in the convenience of application. Stimulation of the circulation, contraction of muscles as from a blow, agreeable sensations, or sharp pain, may all be produced in such a reflex manner, if they are considered desirable. But no further distinctly curative effects can be admitted. And as we shall see later, the same effects can be secured by faradism.

I pass by the mental effects induced by any exaggerated idea of the mysterious power of electric sparks, as beneath our notice. The elements of mystery and of expectant attention doubtless play a part in the treatment of some functional nervous affections. It is an open question how far they may be legitimately employed. If static electricity relieves hysterical affections, it must be admitted that it is entirely by means of the mental effect produced.

II. VOLTAIC ELECTRICITY OR GALVANISM.—A frictional machine does all its work suddenly, in a fraction of a second. It is not capable of producing a constant electro-motive force. This can, however, be obtained from a galvanic battery; and very soon after the discovery by Volta, the use of static electricity was superseded in medicine by that of galvanism. The fact that a voltaic battery furnishes a definite amount of electro-motive force capable of doing a measurable amount of work and producing definite effects on the body suffices to explain its continued use. Yet, when we speak of definite effects from galvanism, I think there are few physicians to be found who will contend for a moment that there is any such certainty regarding the therapeutic effects on the body as there is regarding the use of drugs. Opium will quiet pain; aconite will depress the heart. Is there any statement which can be made with equal definiteness regarding electricity? I think not.

As far as the effects of galvanism are now known, they may be classified under three distinct heads, viz., catalytic, cataphoric, and electro-tonic effects.

a. Catalytic effects. The splitting up of a compound element into its constituent parts is one of the ways in which the work done by electricity is measured. The compound body is put into a state of electrification which makes the condition of its molecules so unstable that they fly apart, and as they burst asunder those which have taken on a state like that of one pole of the battery are repelled from it and appear at the opposite pole. A strong current passing through the body produces intense catalytic effects, disintegrating and destroying the tissues, and raising blisters under each pole, the one containing acid, and the other an alkaline fluid. Even with a weak current the taste produced in the mouth differs at the different poles, one being sour, the other salty. There is no doubt, then, that marked chemical changes may be produced by the galvanic current.

This power, then, may be used like that of any other destructive agent, to dissolve body tissues. In some cases—such as elimination of hairs from the face—it is convenient. How successful it may prove in the destruction of tumors—especially of the internal organs—it is hardly time to judge. In the resolution of strictures its use is strongly combated by eminent authority after thorough trial. In any case the difficulty of limiting its action, the serious nature of the wound which is left, the slow healing and deep scars which remain, combine to make it less certain, less definite, less satisfactory than ordinary surgical procedures—and, consequently, it is not endorsed by surgeons generally.

The use of mild, non-destructive currents has been urged by some, and it has been claimed that a catalytic effect of a moderate kind may aid nutrition. Nutritive processes are dependent on chemical and molecular changes. Is it possible to stimulate these by a constant galvanic current? Theory here is aside from the point. Experience must furnish facts. The only scientific observation which I have been able to find is furnished by Prof. James K. Thacher, of Yale, and it is certainly extremely valuable and interesting. In a case of bilateral paralysis of all the extremities, due to diphtheritic multiple neuritis, Dr. Thacher made a series of therapeutic experiments upon the arms—each arm being treated alone for a week at a time, and its relative gain under treatment being compared with that of the opposite untreated arm. The results were measured in degrees of strength of grip as determined by a dynamometer.

It was found that the arm to which a labile constant galvanic current was applied daily for ten minutes, gained in strength in a degree far greater than that of the untreated arm. So that the gain under galvanism could be exhibited as follows:

	Galvanized arm.	Untreated arm
1. Ten days' treatment to left arm	17° gain	12° gain.
2. Seven " " to right "	15° "	10° "
3. Seven " " to left "	7.4° "	0.9° "

The galvanized arm made almost double the progress of the other (1 : 1.72).

Under faradism there was no gain perceptible, and under massage there was a positive loss.[1]

I know of no other accurately measured, scientific test under proper conditions which demonstrates so perfectly the power of the constant galvanic current to promote nutrition. It would add greatly to our knowledge if similar observations were made. And it is undoubtedly the catalytic effect of the electricity which is responsible for the nutritive changes. These are certainly of the greatest importance in a large number of cases, especially in all forms of paralysis, where it is important to keep the muscles strong. It is undoubtedly through its catalytic action that galvanism produces effects in nervous diseases—if such effects are obtained. It is one object of this discussion to elicit the experience of those present as to these effects. I have never seen a case of organic disease of the brain or spinal cord which I could consider cured by the application of electricity. Such cases sometimes improve under treatment for a time, and then grow worse in spite of it. Others do not improve at all. Perhaps it is well to be more definite in statement.

In diseases of the brain, such as cerebral hemorrhage, sclerosis, abscess, tumor, or embolic softening, as well as in all forms of insanity, I consider electrical treatment useless. It cannot affect the pathological process which causes the symptoms. In diseases of the spinal cord it is usually recommended and often applied. Roughly, we may divide these diseases into (1) inflammatory destructive lesions of the gray matter, and (2) sclerotic processes. In the first class, of which disseminated myelitis and infantile paralysis may be taken as types, there may be an object in reducing congestion; but it is not certain that this can be accomplished for any length of time by electricity, as it can by counter-irritation or cupping. After the acute stage is over, spontaneous recovery will occur in greater or less degree in many cases. Is this aided by the application of electricity to the spinal cord? I have yet to be convinced that it is, though I admit that I still employ the agent in deference to the opinion of certain authorities. In the second class, of which locomotor ataxia is a type, it is theoretically difficult to assign any effect upon the sclerotic process of a change of molecular state. And, practically, it seems to me that few definite results can be affirmed regarding the effects of its application. Ataxia and spastic rigidity do not appear to be removed either temporarily or permanently, and its analgesic qualities are very often disappointing. In spinal affections, therefore, it seems to me that experience does not confirm the statements of some text-books and of those whose interests lie in the direction of its use.

This experience conforms to that of such a careful observer as Gowers,[1] who, in his recent text-book, states that electrical treatment fails in his experience to affect the progress of organic nervous diseases.

Another question of importance is, to what degree the electrical state is induced in deep-lying tissues such as the brain and spinal cord? The body is not homogeneous and the power of conduction of different tissues varies greatly. If two pipes lead out of a reservoir, one free, the other plugged with rubbish, the water will seek the easy outlet to the exclusion of the other. To rely upon the diagrams of the diffusion of electric currents in the body is to be misled. Muscle conducts easily, bone less so, least of all the nervous tissue, which is peculiarly insulated by its fluid surroundings. The result must be that but a small fraction of the current reaches the nervous organs in comparison with the amount applied. Just how much does reach them has never yet been accurately determined, and cannot be from the nature of the case in a state of health.

Recently the spinal cord and brain have been laid bare by surgeons. It would be profitable in future, in appropriate cases, to determine by accurate electrical measurements to what extent currents sent through the body affect these exposed parts of the central nervous system. There is no reason to suppose that such experiments would be dangerous.

In peripheral nerve lesions many of the objections urged against the use of electricity in affections of the central organs are obviated. It is possible to localize the application and to determine by the sensations and motions produced just what nerves

[1] THE MEDICAL NEWS, April 18, 1885.

[1] The following quotations from Gowers are cited in support of the statement in the text:

"There is no evidence that the application of electricity to the spinal column has any influence on the process of recovery in acute myelitis. Its chief value is to maintain, as far as possible, the nutrition of any muscles of which the nerves have undergone degeneration."—Vol. i. p. 235.

No mention of electricity is made by Gowers in dealing with the treatment of chronic myelitis.—Pp. 245-6.

"Electricity has been strongly advocated and largely used in the treatment of infantile paralysis, and there is reason to believe that it is useful, although its influence has been much exaggerated. In no sense is it a curative agent, and there is no evidence that its application to the spine is capable of increasing the degree or accelerating the course of the recovery of the nerve elements. Nor is it easy to obtain evidence of its influence over the muscles. If the wasting is rapid, this progresses in spite of daily and sedulous applications. Nevertheless, its demonstrable effect on the muscles in causing their contraction must have an influence in the right direction upon their nutrition. This is of no avail if no recovery takes place in the spinal cord, but in most cases some recovery in the cord does occur."—P. 270.

"Electricity has little influence on the chief symptoms of tabes. The voltaic current is powerless over either the pains or the ataxy, whether it be applied to the spine or to the limbs."

After alluding to faradization of the skin in pain, and in incontinence of urine, Gowers adds:

"The central cause usually renders local treatment ineffective."—P. 326.

"Electricity is useless in spastic paraplegia."—P. 340.

"The most sedulous and skilful use of electricity—voltaic or faradic—fails, as a rule, to produce any effect on the course of progressive muscular atrophy."—P. 38.

are affected. It is not improbable that favorable nutritive effects are produced by the increased circulation and more rapid chemical changes induced by the agent. It would be interesting to ascertain definite time results in the treatment of these diseases. Is the duration of a lead palsy shortened by the application of a constant current? Is the course of a facial paralysis in any way affected by its use? I have been much disappointed by the lack of rapid results in the former. I have seen the latter go on to the most severe form, with a permanent paralysis, in spite of the most careful applications of electricity. Many cases of both diseases get well. Does electricity aid the cure?

In neuralgia the galvanic current is doubtless of service, the palliative effects of the positive pole being proven. The rule proposed by Dr. Gibney, of increasing the current until the patient has peripheral sensations in the area of distribution of the nerve treated, seems to me of great value, for unless such sensations are perceived it is unlikely that the nerve is really brought into a state of electrification. If the spinal cord is really excited by the current, why should not general peripheral sensations be produced? It is rarely that I have succeeded in causing them, and I do not think they are elicited in the usual method of application.

b. Cataphoric effects. The power of electricity to promote osmosis is well proven. A transfer of substances from the positive to the negative pole through intervening organic tissue can be made. This is termed a cataphoric action. It has been used of late in the production of local anæsthesia, and for the quieting of neuralgic pain; cocaine, morphia, and aconitia having been brought into direct contact with painful nerves in this manner. As a method of treating neuralgia this is of distinct service, as has lately been proven by Dr. Peterson before this Academy. Medicated electric baths, which might be arranged on this principle, cannot be at present commended, since the dosage of the drug thus employed is wholly uncertain.

c. Electrotonic effects. It has already been stated that the application of electricity produces a state of electrification in the molecules of the body. This state varies under the different poles of the battery, and each pole is supposed to produce an effect the exact reverse in kind from that under the other pole. These opposite states are known as anelectrotonus and katelectrotonus. It is not necessary for us to determine whether the state produced is due to a parallelism of molecular vibration, comparable to that occurring in polarized light, or whether it is a state induced in the dielectric, the impalpable ether surrounding the molecules. Suffice it to say that two electrotonic states exist, one at each pole, and that the tissues between the poles share in these states in the direct ratio of their nearness to the poles.

The sudden production of either state excites violent molecular movements in the tissues, and these become doubly violent if either state is suddenly replaced by its opposite.

Each tissue manifests its irritation in its own manner, the muscle by contraction, the motor nerve by sending a motor impulse to the muscle, the sensory nerve by transmitting a sensory impulse to the brain. Hence to excite tissues to functional activity sudden changes in their electrotonic state are produced by suddenly closing or opening or reversing the constant galvanic current. The last-named procedure, reversing the current, or using voltaic alternatives, is necessarily the most active excitant of all. No one can deny the beneficial effects produced by exciting the functional activity of the various organs, especially when, as in paralysis, the organs cannot be voluntarily set to work; for exercise aids nutrition, promotes the circulation, assists metabolism. It is probable that no other method equals this in these respects, massage being decidedly inferior. The electrotonic effect upon the vessel walls is also proven, for a decided dilatation of the smaller arteries can be seen after an application; and when this condition has passed off, if the part be immersed in warm water, the local redness becomes again manifest. This has been ascribed to the chemical changes set up by the catalytic action of the current, but the fact that it is more intense at the negative pole demonstrates that the result is due, in part at least, to the electrotonic state produced; and the fact that it is caused by a faradic current, which has no catalytic effect, confirms this statement. The effects of faradism are exactly the same as those of a very rapidly interrupted galvanic current. Faradism is indeed nothing more than a weak galvanic interrupted current reinforced by magnetic induction. The effects of faradism are, therefore, wholly electrotonic effects, never catalytic or cataphoric. Its convenience in being produced in a portable apparatus is its only advantage over voltaic alternatives. The difference of response to the faradic current from that of voltaic alternatives, in conditions known as the reaction of degeneration, is not to be ascribed to any difference in the nature of the current, but only to the fact that the degenerated muscle will not respond to changes of state so rapidly produced. Since muscular contractions are desired in the treatment of paralysis, it follows that faradism is useless unless the muscles act to it.

Admitting the great use of interrupted currents in exciting tissues to activity by producing changes of electrotonic state, can further claims be allowed? There is one which has already been alluded to in dealing with static electricity, namely the reflex effect of surface irritation. It is not unlikely that changes of circulation or of molecular state—very beneficial in character—may be excited in central organs by

such reflex irritation. It is evident, then, that the only possible effect admitted to occur from an application of static electricity can be produced equally well by interrupted currents.

To sum up the facts here presented we may say that

1. Static electricity offers nothing beyond an interrupted galvanic current, and fails to furnish those effects which are most desirable in the treatment of disease.

2. A constant galvanic current can produce chemical changes which aid nutrition, or destroy tissue according to the strength employed.

3. A constant galvanic current can transfer medicines into the body from without.

4. An interrupted galvanic current, or a faradic current, can excite various organs to functional activity, thereby aiding their nutrition.

5. It is questionable whether the pathological state causing organic diseases can be in any way influenced by electricity.

6. If functional diseases are benefited, it is in an uncertain manner; it being undecided whether it is by influencing the molecular condition, the chemical changes, the circulation, or the electrical state of the organ affected—or by the state of mental expectation induced. The agent is therefore used empirically, and the physiological indications for it are as yet uncertain. As a therapeutic agent its use is very limited and carefully balanced scientific observations are still needed to establish its proper sphere.

It has been the object of this paper rather to sum up certain facts as opposed to tentative theories than to state anything new. It is also the object to elicit expressions of opinion of the use of electricity in therapeutics—based upon the experience of those who have given it a careful trial. All reference to the use of electricity in diagnosis has been purposely omitted.

I cannot, however, close without stating that after the constant use of electrical treatment for the past six years in dispensary and in private practice, I have been disappointed in the results obtained. And I cannot ascribe this lack of result to any defect in the applications, for they have been made with care, with the best of apparatus, and with exact galvanometric measurements, according to the methods described by such authorities as Erb, De Watteville, Benedickt and Beard. My experience coincides with that of Gowers that the therapeutic effects of electrical applications have been much exaggerated and are really very limited and quite uncertain.

INTRAMUSCULAR INJECTIONS OF MERCURY IN SYPHILIS.[1]

BY HENRY BUCKMASTER DEALE. A.M., M.D.,
OF WASHINGTON, D. C.

THE subject of hypodermatic or intramuscular medication in syphilis has, of late, claimed such an amount of attention that I thought possibly a brief history of a few cases, which it was my good fortune to have in charge, might prove of some little interest to this Society.

After a tolerably thorough investigation of the bibliography of the subject, I find that very few of the profession in America have written on this method of treatment; indeed, only three names of our own countrymen were found; France and Germany being the principal localities for its discussion. A method introduced as long ago as 1864, by Scarenzio, in Italy, has until quite recently lain dormant, and is now a subject occupying the minds of many leading syphilographers of the continent.

The majority, or, indeed, nearly all of those whose writings I sought, use either calomel in glycerine or the perchloride of mercury in distilled water, though many other preparations of mercury are recommended, all claiming various advantages for their special preparations.

In the few cases I present, the bichloride of mercury only was used, injected deep into the gluteal muscles, with certainly most satisfactory results, so far as my observation of the cases was carried, though scarcely sufficient time has elapsed to prove anything positive.

Without doubt, at first thought, the mild chloride would seem the preparation possessing superior advantages,—it being injected in the insoluble state, is slowly changed by the chlorides of the blood to the soluble double chloride, thus being absorbed more slowly, and at the same time eliminated very much more gradually, thereby keeping the system under its influence longer, and necessitating fewer injections; but, strange as it may seem, the experiments with calomel have had a much more direful history as regards the formation of abscesses, notwithstanding it is supposed to be the less irritating preparation.

The only objections to this method of treatment urged by its many opponents, are the danger of formation of abscesses, and the pain at time of injection and for a short time subsequent; now, if these be proven unfounded, certainly none but would acknowledge this method as superior in every respect to the old forms of treatment, which have always possessed many serious drawbacks. As given through the alimentary canal, there is a constant tendency at least to a derangement of this tract, with greater

[1] Read before the Clinico-Pathological Society, of Washington, D. C., Nov. 6, 1888.

probability of salivation; the inunction method possesses the objection of uncleanliness with others, etc.

Among the claims to superiority of the intramuscular injections, may be enumerated: the exactness of the amount of mercury absorbed by the system; the avoidance of gastric and intestinal derangements; the slightest probability of salivation; and the absolute knowledge possessed by the physician that his medication is followed, a fact of which he is not always possessed.

In answer to the first, and really only rational objection urged, namely, the danger of abscess, the results of many skilful experiments, as well as my own slight experience, demonstrate that this danger may be reduced to a minimum, or, indeed, *nil*, if due care and caution are exercised by the practitioner.

J. A. Bloxam, of Charing Cross Hospital, England, gave 1924 injections of the bichloride of mercury, with only one abscess, and this he was convinced was due to the injection not having been inserted sufficiently deep. Lewin is reported to have given the incredible number of 300,000 injections, with only 20 abscesses; Parkert 5000 injections, with no abscesses; Segmund 631 injections, with 5 abscesses; Smet 900 injections, with none; and I myself have given about 230 injections, with not a single abscess. All the above statistics are where corrosive sublimate is used in varying doses.

The result is by no means so favorable as regards abscesses when calomel is the preparation injected. Smirnoff gave 1523 injections of calomel in varying proportions from ⅜ to 1½ grains, with 72 abscesses, or about four per cent., and as far as I was able to discover, I found no one who recorded more satisfactory results with calomel than Smirnoff.

Dr. J. C. Wilson, of Philadelphia, in a very interesting article in THE MEDICAL NEWS, reports several cases with most satisfactory results when calomel was used; he much prefers this preparation, on account of its "prolonged and relatively mild influence." Women, it appears, are more subject to abscesses from injection than men, due, it is supposed, to the greater amount of cellular tissue in the locality the injections are given, and the solution not being thrown into the muscle,—as all the patients under my care, in which this treatment was followed, were males, I, personally, have had no experience in this regard.

In reference to the pain inflicted, all observers state that it is of rare occurrence that any objection is urged on this accouut, though that there is slight pain, there is no doubt; in only one instance was this objection made by those under my care. It is recommended that a few drops of cocaine solution be added to the mercury solution, but I think this is fraught with some danger.

The following is a brief synopsis of three or four of those cases under my supervision:

CASE I.—J. R., white, male, twenty-eight years, laborer, Irish, had primary sore about six months previous, applied for treatment suffering from pronounced secondary symptoms, viz,, alopecia, sore throat, periosteal pains, etc., the cervical, inguinal, and epitrochlear glands indurated.

He was first given green iodide of mercury one-third of a grain t. i. d., which so soon deranged his stomach, with no apparent abatement of symptoms, that it was determined to try intramuscular injections of the bichloride of mercury; one-sixteenth of a grain was injected daily for four weeks; the pain in the tibia, which had been so severe as to keep him awake at night, gradually disappeared, and all other symptoms rapidly improved. He returned to his work, reporting from time to time for six months, with no return of any symptom.

CASE II.—J. C., white, male, thirty-three years, laborer, American, had primary sore quite ten years before, and always since that time had some pronounced symptom, though having been under medical care off and on during all these years. He came to the hospital especially for treatment of his eyes—he was suffering from cyclitis and choriditis, being only able to distinguish light from darkness. His alimentary tract was in such a condition, from the excessive use of mercury, that not the lightest diet could be retained, and he had severe diarrhœa. His body and limbs were absolutely covered with a coppery eruption, his hair and beard thin and in patches, suffering at times with most excruciating pains in limbs. Twenty-five hypodermatic injections of $\frac{1}{16}$ Hg_2Cl_2 were given within a month and a half, with bathing the eyes in hot water, and atropine solution (4 grs. to ℥j) in eye morning and evening. His eyesight gradually improved until he was able quite readily to walk about house and grounds, also to read large print. The eruption to a great extent faded, though not entirely; his general health and strength were much better than for years. At one time there being some slight tenderness of gums, the injections were omitted for five days, after which time they were given daily until his discharge.

Although asked to report from time to time, nothing was heard of him except that he had fallen into the hands of a physician who was continuing the same form of treatment, but with what further results I cannot state.

CASE III.—J. A., white, male, forty-one years, laborer, American, primary sore one year before, suffering from a most severe form of iritis, body covered with eruption, inguinal glands indurated.

Twelve injections of $\frac{1}{16}$ gr were given him, with a rapid disappearance of the iritis, and fading of the eruption.

CASE IV.—D. R., white, male, thirty-nine years, bookkeeper, American, had primary sore some years before, exact time not known. He had extreme sore throat, with extensive ulceration of soft palate, intense pain in limbs, thereby incapacitating him for work.

Twenty-five injections were given daily, after which ten injections were given at the rate of one every other day, finally twelve injections at the rate of one twice a week—making a total of forty-seven injections with an entire disappearance of all symptoms; this case is still under observation, it now being five months since any treatment was given.

Several other cases might be cited, but I have selected these as the most pronounced in symptoms, though the results in all were satisfactory.

As before stated, I have given in all 230 injections with no evil consequences and with most satisfactory results; now I am aware that such a limited experience does not permit me to urge that abscesses are inexcusable and due to lack of care on the part of the practitioner, but without doubt it is permissible to say that if proper care is exercised such a calamity would be exceedingly rare. The following are the precautionary methods which guided me:

1. Wash the part to be injected with a warm carbolized solution.

2. Wash the syringe and needle with warm carbolized solution before and after each injection.

3. Have the chill taken off the mercurial solution by placing the bottle in hot water, while making the other preparations.

4. Inject with a sharp, fine needle deep into the muscles of the buttocks.

5. Alternate the injection from day to day from right to left side.

6. After removing the needle use friction over the point of injection for a few seconds.

Much trouble is caused by the needle used, the action of the bichloride on the metal corroding it and making it brittle; but I have found that if the needle were well greased with vaseline before and after each injection, this could be obviated, also the small wire inserted through the needle should be anointed, with these precautions I have used the same needle for five months.

The solution used was as follows:

℞.—Hydrarg. bichlor. . . . . gr. iij.
Sodii chlor. . . . . ʒss.
Aquæ destil. . . . . ʒx.—M.
Inject ♏x to ♏xx.

It is advised to give some simple tonic during the time the treatment is being continued.

These results of many most skilful and cautious experimenters, with my own slight experience, have been presented, not so much to laud the intramuscular injections, or any special preparation of mercury in the injection, as I believe with due care any of the forms of mercury suggested could be used without danger, being only guided by the urgency of the symptons; but rather to prove that a method dismissed by most authors with a very few unfavorable words, and discountenanced by many practitioners on account of danger of abscesses, does not possess by any means the dangers or drawbacks attributed to it; also to urge its trial by those who have not yet proven or disproven these assertions.

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THE TREATMENT OF ACUTE INFLAMMATION OF THE MIDDLE EAR.[1]

BY GORHAM BACON, M.D.,
OF NEW YORK.

IT is not my intention in this paper to describe the different methods of treatment that have been recommended from time to time, in acute inflammation of the middle ear, but simply to refer to a plan of treatment which, in my hands, has proved most satisfactory in its results, and to call attention to the use of the artificial leech, which I described in the *N. Y. Medical Journal* of Jan. 7, 1888. I feel justified in again referring to this instrument, as a number of others, who have since used it, have arrived at similar conclusions as myself.

FIG. 1.

The artificial leech consists of a scarificator, composed of seven lance-shaped needles, which are concealed. The depth of the punctures can be

FIG. 2.

regulated by screwing or unscrewing the end or cap of the scarificator. When this has been determined, the spring is pulled back, the instrument is applied to the parts and the tissues scarified.

[1] Read by title before the New York State Medical Society, Feb. 5, 1889.

A cupping-glass made adaptable to the parts about the ear, is then immersed in hot water for a few moments in order to promote the bleeding as much as possible and applied close to the tragus, below the lobule, or over the mastoid process, according to the seat of the inflammation. The glass itself holds three drachms. The cup when applied is held in position by the patient.

The reasons that I gave a year ago for discarding the leech and substituting the scarificator and cupping-glass were the following:

1. The leech is particularly disagreeable to many patients, especially children.

2. It is frequently very difficult to arrest the bleeding following a leech-bite.

3. A leech-bite occasionally gives rise to erysipelatous inflammation and ulceration and not infrequently produces a circumscribed abscess even in apparently healthy individuals.

4. Leeches are not always to be had, especially in the country, and are very frequently a troublesome remedy besides being expensive.

With the artificial leech, on the other hand, the quantity of blood abstracted can be entirely regulated and its application is more agreeable to the patient, besides being an instrument that is always at hand.

I use the artificial leech not only in dispensary practice but also at my office, so that I am able to note the good effects usually following the local abstraction of blood, while I am certain of having the leech applied at the proper point about the ear, which is a most important consideration.

It is in the first or hyperæmic stage, either of catarrhal or purulent inflammation of the middle ear, where the tissues are deeply congested, that the local abstraction of blood is followed by such favorable results as are shown by relief from the pain and tension in the ear. The inflammatory process will frequently be cut short at once by the early application of the leech, and I believe that in all cases the further progress of the disease will be greatly modified.

Not only is the local abstraction of blood by means of the artificial leech followed by most beneficial results in the early stage of acute inflammation of the middle ear, but also in acute inflammation of the external auditory meatus and mastoid cells.

The following are a few among a great number of cases in which I have used the artificial leech.

CASE I.—Wm. C., æt. eighteen years, was seen by me Jan. 11, 1887, on account of an ear-ache in his right ear, which commenced January 4th. The discharge appeared January 9th, but the pain continued. He had a similar attack a year ago. Watch, right ear, 0″; left ear, normal. Bone-conduction better than the aërial for the right ear. Right membrana tympani swollen, inflamed; perforation in the post inferior quadrant; some scanty purulent discharge in the middle ear, which was forced out by inflation. The artificial leech was applied and the pain was somewhat relieved. He was also given drops of zinc sulph., grs. iv–℥j, to use twice a day.

Jan. 15. The pain in the ear disappeared two hours after the cupping at the last visit and has not troubled him since. The canal contains pus in greater quantity. There is a slight enlargement of the glands over the mastoid. To continue using the same drops.

CASE II.—J. O'B. consulted me Feb. 8, 1887, on account of pain in the left ear, which he had had for two weeks. It is especially severe at night and there is some pain on swallowing.

Examination.—Right auditory canal contains cerumen. Left membrana tympani somewhat congested and very much retracted. Watch, left ear $\frac{15''}{48}$.

Politzer inflation somewhat painful. The artificial leech was applied just below the lobule and over the mastoid process. There was immediate relief from the pain. The patient was not seen again.

CASE III.—Thomas W., aged nineteen, a carpenter by occupation, said that for the last three nights he has had severe pain in the left ear. There is also a dull throbbing noise. Watch, right ear 4″; left ear, contact. The bone-conduction is slightly better than the aërial for both ears. Left auditory canal congested; there is also slight inflammation of the membrana tympani but no perforation.

The ear was inflated after Politzer's method; some slight cheesy matter was syringed out and the artificial leech applied.

Feb. 18. He has had no pain since. There is a slight discharge in the canal. Politzer inflation. To use drops of zinc. sulph. grs. iv–℥j. Watch: right ear, 8″; left ear, 5″.

25th. Much improved. To continue the same treatment.

CASE IV.—Max S., aged forty-three, a porter, complained March 4, 1887, of a sore throat and cold, which he had had nine days ago and which extended to the left ear. He says he has had a blister over the mastoid. The pain has been very severe every night but it is somewhat less to-day since the ear has been discharging.

Examination.—Right membrana tympani somewhat retracted and hazy; cone of light very small. Left auditory meatus inflamed and contains pus.

The artificial leech was applied just in front of the tragus and he was given drops of zinc. sulph. grs. iv–℥j.

The patient returned March 11, and said that he had no pain on the night of March 4, but that it has been present more or less since then. The ear was again cupped. He was not seen again.

CASE V.—Rebecca K., aged thirty-eight years, came to the Infirmary March 29, 1887, and said that she first had pain in the right ear two weeks ago. The right membrana tympani was found very much congested, as well as the inner end of the auditory canal; the left membrana tympani retracted and showing evidences of catarrhal changes. The arti-

ficial leech was used and she was given drops of atropiæ sulph. grs. iv–℥j.

She returned April 1, and said that she had not had much ear-ache but considerable pain in the right side of the head. The congestion of the drumhead and canal was much less.

CASE VI.—Mary G., aged twenty-five, a domestic, came to the Infirmary April 5, 1887. She says that last week she had a severe head-cold. Sunday night, three days ago, she had pain in the right ear, which has been present more or less since then, but has been somewhat easier last night and to-day. Watch: right ear, 0″; left ear, 15″. The right membrana tympani very angry-looking and congested and slightly bulging. The inner end of the auditory canal congested and losing its dermal lining. The membrana tympani was punctured and a few drops of pus evacuated. The artificial leech was then applied just in front of the tragus.

April 8. She returned to-day and said that the pain had been much less ever since she was here. The drumhead shows less congestion and there is some pus in the canal, which was syringed out. Watch, right ear, 1″. The ear was inflated by Politzer's method and she was given drops of zinc. sulph. grs. ij–℥j.

CASE VII.—Anna K., aged fifty-three years, was seen April 19, 1887. She says she never had any previous ear disease. She has had a cold in her head and chest most all winter. She has lately had a fresh cold, and three days ago the right ear pained her severely. This continued yesterday but is not as bad to-day, as she only has an occasional stinging pain. She complains of a buzzing noise in the ear and there is some tenderness behind the auricle and below the mastoid. Watch: right ear, 1″; left ear, 6″. The right membrana tympani very much congested as well as the entire auditory canal, which is swollen as well.

The artificial leech applied to the ante-auricular region and also over the apex of the mastoid process caused the pain to disappear at once. The tinnitus was also much less. She was given drops of atropiæ sulph. grs. iv–℥j. She was not seen again.

CASE VIII.—John Van T., aged thirty-three years, railroad employee, May 27, 1887. He has had an ear-ache on the left side steadily for a week and on examination, the bottom of the left auditory canal contains some inspissated pus, which was removed with the syringe. The drumhead was then found perforated and congested, as well as the inner end of the auditory canal.

The leech was applied in front of the tragus and just below the pinna. The pain entirely disappeared. The patient was not seen again.

CASE IX.—Caroline A., aged nine years, was seen at the Infirmary, April 26, 1887. Two months ago, she says, she first had a discharge from the left ear which lasted for two days. She had no further trouble then till four days ago, when she had severe pain at night. This has continued day and night ever since and there has been no discharge.

Right membrana tympani dull, thickened and retracted, with almost no cone of light. Left membrana tympani macerated, congested, with the dermal layer peeling off, as well as from the inner end of the auditory canal, which is likewise congested.

An artificial leech applied, relieved the pain at once. The ear was inflated by Politzer's method and she was ordered to douche the ear with warm water at home.

April 29. The ear has been better since she was here, but this morning she experienced some pain. The leech was again applied. The patient was not seen again after this.

CASE X.—A physician, aged thirty years, came to see me January 3, 1889, on account of a dull pain and slight deafness in the left ear, which he first noticed the previous night. There was also some tinnitus and an examination of the ear showed some congestion of the left membrana tympani, especially along the handle of the malleus.

The artificial leech was used, giving immediate relief to the pain. An astringent spray was used in the posterior nares and drops of a 4 per cent. solution of cocaine instilled warm into the ear. He was also told to take small doses of aconite. He returned the following day and an examination of the ear showed absence of all inflammation. The pain and noise in the ear had entirely disappeared.

A NEW METHOD OF MAKING ANAËROBIC CULTURES.

BY JOHN A. JEFFRIES, M.D.,
OF BOSTON.

ALL who have had occasion to grow bacteria without oxygen must have been struck by the difficulty of the various methods described, the time required, the expense, and the doubt in each case if oxygen has really been excluded.

The earlier methods of covering plate cultures with a sheet of mica, or filling up test-tubes with sterile gelatine, are insecure and do not offer any evidence if oxygen has obtained access to the culture, while the last has the great objection of making the culture inaccessible.

The more recent methods, which depend upon driving out the oxygen with carbonic dioxide or hydrogen, are very troublesome in practice, and, as an atmosphere is left, often leave one in doubt if oxygen is really absent, to say nothing of the presence of the carbonic dioxide. The latest method depending on the absorption of oxygen by pyrogallic acid in caustic potash solution is efficient in removing the oxygen; there is always, however, danger of leakage around the cork.

None of the methods give any evidence of gas being given off by the culture.

Desiring to determine the ability to grow without air, as well as to gauge the fermentative powers of a large number of species of bacteria, I was forced to search for an easier and more accurate method, and have adopted the very simple one of inversion over mercury.

It is only necessary to inoculate the gelatine culture as usual, fill the tube up with mercury, cover with the thumb and invert, as done in preparing tubes for gas analysis, in a small crucible containing mercury. The tubes can then be stood in a rack and watched from day to day as easily as if in the open air.

This method is certainly simple, takes less than a minute's time and is inexpensive; besides the advantages in execution over the ordinary methods, it has the further advantage of giving prompt proof of the presence of air, such rising to the surface of the mercury on inversion, and retaining any gases that may be evolved by the culture.

As the time of manipulation is very short, the danger of contamination is slight. Should any foreign germ get in, it must form a colony and become visible.

It is almost needless to say that sugars and starches may be added to the gelatine, and that the mercury should be sterilized in the steamer before use. If the mercury is dirty, it can be filtered, cleansed with twenty per cent. nitric acid, or, what is much simpler, wiped with absorbent cotton.

The fear which I at first entertained that the mercury would kill the bacteria has proved unfounded, the plants growing on the surface of the gelatine in direct contact with the mercury.

It is my habit in cases where no growth takes place to pour out the mercury, put in a cotton plug and stand the tube back in the rack. After the lapse of a few days, growth usually takes place, thus proving that the plants have not died from poisoning or suffocation.

MEDICAL PROGRESS.

A New Procedure for Destroying Tattoo-marks.—It is well known how difficult it is to destroy tattoo-marks, which are at times so annoying to the unfortunate ones who have been foolish enough in a thoughtless moment to allow their bodies to be covered with designs often more or less obscene. DR. VARIOT has just indicated a new procedure, after a number of experiments which he has carried out at the Central Infirmary of the Paris prisons. He pours at first upon the portions of the tattooed skin a concentrated solution of tannin; then, with the aid of a bunch of needles like those employed by the tattooers, he makes close punctures over the whole surface of the discolored skin. He then passes a stick of nitrate of silver with considerable pressure and friction over the whole surface upon which he has operated and pricked in the tannin. He allows the concentrated solution of the silver salt to act for a few instants upon the epidermis and the derma until the pricked points become of a dark or black color. He then wipes off the skin, and the surface is found to have become black from the formation of a tannate of silver which is produced in the superficial layers of the skin.

In the first two days which succeed the cauterization there is a slight inflammatory reaction, with a variable amount of pain. In the two following days all parts which have had the tannin pricked in and the nitrate of silver subsequently applied take on a deep black tint, forming a sort of crust, or eschar, which is thin but quite adherent to the deeper parts. On the third or fourth day after the operation the crusts are wholly painless. If, however, the tattoo has been extensive, the movements of the parts may become painful. At times a little suppuration takes place beneath the crust, but there is never a great degree of inflammatory reaction. . . . In from twelve to eighteen days the crust, or superficial eschar, becomes detached spontaneously, the derma and epidermis have become repaired beneath it, and there is seen in place of the tattoo which has fallen with the crust a superficial red cicatrix which becomes progressively decolorized, and two months after the operation is but very little noticeable.

Dr. Variot has employed without success fly-blisters; the red-hot iron, which may leave disfiguring cicatrices; tattooing with white substances, such as powders of enamel, pricking in milk, phenic acid, and tincture of cantharides. He has used tannin alone, acetic acid, the acid oxalate of potassium, and the ten per cent. solution of nitrate of silver—all to no purpose. The author thinks that his procedure could be employed with advantage in natural pigmentary spots and in congenital nævi more or less extensive and more or less deforming. Apropos of Dr. Variot's communication to the Society of Biology, Dr. Dupuy said that in the islands of the Indian Archipelago they cause tattoo-marks in Europeans to disappear by practising a new tattooing with the juice of the *Carica papaya*. The operation leaves no cicatrix, and takes away red tattoo-marks as well as the blue ones.—*Journal of Cutaneous and Genito-Urinary Diseases*, March, 1889.

Acute Gonorrhœa treated successfully by a New Method.—DR. JOHN M'CAW, of Belfast, reported at a meeting of the Ulster Medical Society held January 23, 1889, a case of gonorrhœa contracted four days previously, treated by the introduction into the urethra of medicated bougies; the medicament consisted of sulphate of thallin of five per cent. strength.

Before introducing the bougie he made the patient micturate, in order to clear the urethra of discharge, and then passed the bougie up to the ring, and directed him to hold the meatus quite close, so that none of the application could flow out as it melted. He kept him lying on his back for twenty minutes, at the end of which time he withdrew the spring and closed the meatus with cotton-wool. During the time the bougie was in the urethra he complained of smarting pain, but after he withdrew the spring the pain ceased entirely, and he expressed himself as feeling comfortable. He introduced one every evening after this, and on the third day he called to say he was quite cured, having no discharge of any kind, and no pain on passing water. The day following happened to be his busiest day in the week, as he had to work to twelve o'clock at night, and be on his feet the greater part of that time. In consequence of this he could not use his bougie that day at all, and on the next morning there was a slight return of the former symptoms; but he began anew his treatment, and after using two more bougies, was again perfectly cured. He

has remained so since, although he has undergone the heavy day of the week which caused him to relapse before, and this time with impunity. No bad after-effects of any kind resulted from the treatment, and his patient was very grateful, as well as very much surprised and delighted, for he had been looking forward to a two months' course of copaiba-drinking as in a previous attack with anything but pleasant recollections.—*Dublin Journal of Medical Science*, March, 1889.

Tannin Treatment of Phthisis.—DR. E. HOUZÉ, of the Hospital St. Jean, Brussels, after having tried the tannin treatment on all his phthisical patients for the last year and eight months, states as the result of his observations that it gives excellent results in all stages of the disease, and especially in the condition where cavities exist. Indeed, he has no hesitation in declaring that of all the different kinds of treatment for phthisis which he has tried this has given by far the most encouraging results. The dose he employs ordinarily is fifteen grains, which quantity is taken three times a day. It is, as a rule, well borne; where this is not so, it is ordered to be taken with meals. After the first few days the expectoration and the sweats diminish, the cough decreases, and in many cases the appetite undergoes a marked improvement. The majority of the patients suffered from some slight degree of constipation, though in some this feature was sufficiently marked to require treatment; while others, again, suffered from diarrhœa. The character of the expectoration changed for the better, the sputa becoming white and frothy instead of green and firm. In some cases the diminution of the expectoration was followed by increased dryness of the cough, so that the patients complained that it fatigued them more; this was easily remedied by prescribing a few spoonfuls of syrup of codeia. The physical signs underwent a remarkable change for the better, at least those depending on auscultation, moist râles giving place to dry rhonchi, and large gurgling râles decreasing progressively until they gave place to mere blowing respiration. These changes were evidently due to the drying up of the cavities, in consequence of which the hectic present in many of the cases vanished, the patients increasing considerably in weight and gaining strength in a remarkable manner. The percussion signs were not found to undergo so marked a change as those dependent on auscultation, but even here some improvement could be detected. No bacteriological observations were made.—*Lancet*, March 9, 1889.

Treatment of Ozœna.—*General treatment* consists in the use of tonics, cod-liver oil, and iodine preparations.

Local treatment must be antiseptic, hence the patient should make use of nasal irrigation, using for this purpose from two to four pints of a sulphurous water, or a salt or chlorinated solution (using one tablespoonful of rock salt to two pints of water) or a solution of potassium.

A second irrigation should be made with an antiseptic solution of chloral, of creolin, of salicylate of soda or carbolic acid, as, for example:

℞.—Creolin . . . . . 1 part.
Alcohol (pure) . . . 120 parts—M.

A solution to be made by taking one teaspoonful of this mixture to two pints of warm water.

Or,

℞.—Carbolic acid . . . . 20 parts.
Pure glycerin . . . . 100 "
Alcohol (90 per cent.) . . 50 "
Water . . . . . 350 " —M.

Sig.—A tablespoonful to two pints of warm water.

After the lapse of several weeks, treatment is completed by the application of astringent powders such as tannin, which has been rendered antiseptic with chloral or carbolic acid. The following formula is recommended by Dr. Moure:

℞.—Carbolic acid . . . . 40 parts.
Resorcin (crystallized) . . 6 "
Glycerin (pure) . . . 100 "
Water . . . . . 1000 "
Antiseptic vinegar . . . 1 part.—M.

or,

℞.—Camphor . . . . 8 parts.
Tincture of iodine . . . 10 "
Tar . . . . . 12 "
Alcohol (40 per cent.) . . 100 "
Water . . . . . 250 " —M.

Heat over an alcohol lamp and inhale the steam.

The applications of the powder as well as the steam inhalations are to be repeated, the latter mornings and evenings, for months and even for years.—*Revue gén. de Thérapeutique*, February 14, 1889.

Gangrene of the Colon: Successful Resection.—In the report of the meeting of the Edinburgh Medico-Chirurgical Society, held December 5, 1888, reference was made to a case of cure, by resection of the intestine, of a fecal fistula, which was the result of extensive gangrene of the transverse colon. The case, which was under the care of Mr. Cotterill, Assistant-Surgeon to the Edinburgh Royal Infirmary, has since been published. The patient was a very stout woman, eighteen stone in weight, and thirty-eight years of age. She had been subject to umbilical hernia for seven years. When seen by Mr. Cotterill she was seven months pregnant. The rupture was a bright red and angry-looking prominence about fourteen inches in diameter. The patient vomited coffee-colored fluid mixed with blood. The sac was opened, and was found to contain a large coil of gangrenous transverse colon, much sloughy omentum, and free from feculent matter. The gangrene appeared to be due, not to strangulation, but to pressure of the structures in the sac, between the pregnant uterus below and a firm binder which had been worn above. Fifteen inches of colon were cut away, and the ends of the gut were stitched to the edges of the skin-wound. The patient gave birth to a child three days after the operation.

For three months after convalescence the patient was troubled with prolapse of the intestine, with discharge of feces whenever she walked much about. She again put herself under Mr. Cotterill's care. He succeeded in keeping patent both sides of the intestinal tract, and then performed resection. The two cut ends of intestine were freed from adhesions, the upper being first ligatured to avoid the escape of feces. Traction was then made on the two ends until normal gut, covered with peritoneum, protruded sufficiently for resection. Instead of using a clamp, the operator passed a piece of thin India-

rubber tubing through a small hole in the mesentery and round the gut, fixing it there with a pair of catch forceps. Four inches of the upper segment of the colon and three of the lower were then cut away, with portions of mesentery. As the lower segment had been five months in abeyance, it was very narrow and hard to join to the upper piece. By careful introduction of over a hundred stitches, the ends were brought satisfactorily together. Fine curved needles were used, round, not flattened, and threaded with the finest Chinese twisted silk, and the Czerny-Lembert suture was employed. The cut edges of the mesentery were sutured together, and the gut was returned into the abdomen. The large umbilical opening was brought together by deep silk stitches, and a pad and binder were applied. The operation took three hours. On the third day feces passed. The patient made a good recovery. No less than twenty-two inches of large intestine were removed in the course of the two operations.—*British Med. Journal*, March 2, 1889.

The Duration of the Life of Pathogenic Microbes in Water.—DRS. I. STRAUS and A. DUBARRY, in an exhaustive paper upon this subject, conclude with the following *résumé*:

Bacillus anthracis (without spores) was found alive in water at the end of 16, 24, 28, 65, and 131 days. Dr. Meade Bolton found it dead at the end of 6 days; while Dr. Wolffhügel found it still alive at the end of 15 days.

Bacillus of typhoid fever was found alive after 30, 35, 43, 69, and 81 days. Dr. Meade Bolton found it alive after three weeks to one month; while the researches of Wolffhügel and Riedel found it alive after 21, 27, and 28 days.

Spirillum of Asiatic cholera found alive after 16, 26, 30, and 39 days. Drs. Wolffhügel and Riedel found it alive in sterilized river water, after seven months.

Bacillus of tuberculosis found alive after 24, 25, 27, 30, 75, and 115 days; its virulence, however, seemed to be weakened from its long stay in the water. Drs. Chantemesse and Widal have found it alive in sterilized river water at the end of 50 and 70 days.

Bacillus of glanders found alive after 19, 28, 50, and 57 days.

Streptococcus pyogenes found alive after 8, 10, and 15 days.

Staphylococcus pyogenes aureus found alive after 9, 13, 15, and 21 days. Dr. Meade Bolton has found it alive after 20 and 39 days.

Bacillus of green pus found alive after 20 and 73 days.

Pneumo-bacteria of Friedländer found alive after 4, 7, and 8 days.

Micrococcus tetragenus found alive after 19 days (according to Dr. Meade Bolton, after 4 to 6 days).

Microbe of chicken cholera found alive after 2, 3, and 8 days.

Bacillus of rouget found alive after 17 and 34 days.

Bacillus of septicæmia of the mouse found alive after 19 and 20 days.

Thus, contrary to the opinion generally held, and above all defended by Dr. Meade Bolton, the foregoing would prove that there is no radical distinction to be made between the pathogenic microbes and the common microbes of water, as to their faculty of multiplying and living in water. A large number of pathogenic microbes possess this faculty, although to a less degree than the ordinary water microbes.

This is a conclusion, the correctness of which has already been admitted by Drs. Wolffhügel and Riedel.

As to the bacillus anthrax, the authors have shown that, placed in distilled water, it will give birth to spores.

This is then, no doubt, the reason why the bacilli (which produce spores) show a greater vitality in water than the micrococci. Furthermore, the chemical composition of water has no appreciable influence over the duration of the life of the pathogenic microbes living therein; they live equally as long in absolutely pure distilled water, or in water charged with organic and inorganic material.—*Archives de Méd. Expérimentale*, January, 1889.

Anæsthetic Effects of Carbonic Acid Spray.—PROFESSOR BROWN-SÉQUARD has on various occasions drawn attention to the anæsthetic properties of carbonic acid employed in inhalations or in the form of spray on the larynx. He stated at a recent meeting of the Société de Biologie that he lately had recourse to this procedure in a case of lumbago, and obtained complete success. The analgesia produced by the carbonic acid is sufficiently durable; he had seen it persist during thirty-six hours.—*Lancet*, March 2, 1889.

Colchicin in Diseases of the Eye.—DR. DARIER at the last meeting of the Parisian Society of Ophthalmology recommended colchicin in eye affections. The best results were obtained in marginal ulcers of the cornea of gouty origin, in certain cases of iritis, scleritis, and anterior sclero-choroiditis; also in certain forms of serous iritis doses of $\frac{1}{32}$ to $\frac{1}{16}$ of a grain were found of great service. In chronic and severe cases in which salicylic acid was powerless, colchicin generally effected a cure. The author administers colchicin in pill form, each pill containing $\frac{1}{64}$ grain of the drug of which from 1 to 2 or 4 or even 6 pills can be taken daily. Care must be taken to instruct patients to reduce the dose as soon as intestinal derangements manifest themselves. Treatment must be continued until a complete cure has been effected, otherwise relapses will occur. Some patients have taken as many as 200 pills, without complaining of unfavorable symptoms.—*Wiener med. Wochenschrift*, February 24, 1889.

Acupuncture in Enlargement of the Spleen.—At the Congress of the Italian Society of Medicine, held at Rome some months ago, DR. FELETTI related two cases of chronic malarial enlargement of the spleen which he had treated successfully by acupuncture. He used steel needles, such as are used for the electro-puncture of aneurisms. Having first carefully disinfected the needle, he plunged it into the substance of the spleen, leaving it there just long enough to be sure that it was in the right place. The procedure is almost painless. In one of his cases Dr. Feletti had an opportunity of examining the organ after death, which occurred (from tuberculosis) a fortnight after the last puncture. With the naked eye, small brown spots could be seen in the spleen at points corresponding to the punctures. Microscopic sections showed a roughly triangular area with its base toward the capsule, which at that point was broken; this area

was occupied by young connective tissue, together with the remains of a blood-clot. In the discussion which took place on Dr. Feletti's paper, Dr. Fazio spoke highly of the results of parenchymatous injections of quinine in similar cases, which combined the mechanical effects of puncture with the medicinal action of the drug.—*British Medical Journal*, February 23, 1889.

Treatment of Pulmonary Abscesses.—DRS. SPILLMANN and HAUSHALTER (*Revue méd. de l'Est*) lays down the following rules for the treatment of pulmonary abscesses.

1st. Before interfering surgically, one should assure himself, and especially by means of an exploratory puncture, of the existence as well as the locality of the abscess.

2d. When the diagnosis of an abscess is made during the course of a pneumonia, all methods of interference are to be avoided; should the pneumonia be cured and the abscess still persist, then intervention may lead to a rapid recovery, or at all events prevent grave accidents resulting from the opening of the abscess into the adjacent structures.

3d. Before opening the abscess it would be well to provoke or bring about pleural adhesions, if the same do not already exist.

4th. To find the abscess the best mode of procedure would seem to be costal resection and the opening of the lung with the thermo-cautery.

5th. Assist by means of tubes the thorough drainage of septic secretions, discard all antiseptic washings and use instead dry dressings.—*Revue de Thérapeutique*, February 15, 1889.

Trephining in Epilepsy.—DR. PÉAN related, at the meeting of the Academy of Medicine last week, in his own name and in those of MM. Ballet and Gelineau, a case of partial epilepsy produced by a cerebral tumor in a man aged twenty-eight years, which was cured by trephining. The fits were marked by painful spasm of the right great toe, followed by stiffness of the corresponding lower limb, tonic convulsions, succeeded by clonic convulsions of this limb, which were afterward propagated to the arm and the face of the same side. Other symptoms appeared, which led the authors to suppose that the fits were due to a cerebral tumor situated at the level or in the neighborhood of the motor centre of the right inferior limb; it was, therefore, decided to resort to trephining. After the ablation of the neoplasm, which consisted of a fibro-lipoma developed at the expense of the pia mater, a drainage tube was left in the cavity produced by the tumor. The four fragments of the dura mater were sutured with catgut, and those of the scalp with the "hair of Florence," and then antiseptic dressing was applied. Eight days after the operation the threads and drainage tubes were removed; on the tenth day cicatrization was complete. A few convulsive twitches, probably due to the irritation of the cerebral substance, manifested themselves in the first few days following the operation. This was two months and a half ago, and two months subsequently to that date the patient did not present any epileptiform manifestations. The cure may, therefore, be considered complete.—*Lancet*, March 2, 1889.

Inhalations of Red Iodide of Mercury in Lung Tuberculosis.—DRS. MIGUAL and RUEFF, of Paris, after numerous and careful investigations, the results of which were most satisfactory, recommend inhalations of red iodide of mercury in lung tuberculosis. After the first *séance* the cough and the expectoration, in individuals with large cavities, were diminished, and the expectoration lost its offensive odor; with further treatment the night-sweats and fever disappeared; the general condition improved and the patients gained in body weight. The formula used was as follows:

℞.—Red iodide of mercury . . 1 part.
Iodide of potassium . . 1 "
Water . . . . . 1000 parts.—M.

This solution was used as a spray, at the beginning once, and later on—when the patient had become accustomed to the irritation—twice daily; applied in this manner the red iodide is harmless. Should the inhalations become too irritating the solution may be weakened to 1 to 2000. The results obtained with this weaker solution will not vary from those obtained with the stronger one, as the red iodide of mercury kills bacteria in a solution of 1 in 40,000. One of the principal features of success in treatment depends upon the duration of the same, which can be prolonged for one year without doing harm.—*Wiener med. Presse*, February 10, 1889.

On the Rapid Curative Treatment of Cystitis.—DR. THOMAS MORE MADDEN recommends, in the *palliative treatment* of uncomplicated cystitis, long-continued warm baths, washing out the bladder through a double catheter with plain warm water, thin flaxseed tea, or a solution of boro-glyceride; conjointly in all instances with absolute rest in bed, the free use of diluents, together with the administration of the old-fashioned Dover's powder in small, frequently repeated, doses, as the best opiate in these cases; and lastly, above all, the use of boracic acid in ten or fifteen grain doses three or four times a day, by which the generally fetid ammoniacal urine is deprived of its fetor and rendered less irritating to the endo-vesical mucous membrane.

In the *curative treatment* he has abandoned the operation for the formation of an artificial vesico-vaginal fistula, through which the urine may drain away as fast as secreted, believing that we may obtain all its advantages more easily and more safely, simply by so thoroughly dilating the urethral canal with the instrument exhibited as to enable us to pass the index into the bladder, and thereby paralyze the contractility of the sphincter of the canal for a time, which may be indefinitely extended by repeating expansion in the same way as often as may be necessary. It may, moreover, be advisable in some instances to remove the proliferating vesical mucous membrane by the cautious employment of a dull wire curette, the author's, which he used with advantage in cases of this kind. And, lastly, whether the curette be required or not, the method of dilatation just described should, in all cases, be conjoined with the topical application of carbolic acid to the mucous surface. The latter is best employed in the form of glycerine of carbolic acid of the *Pharmacopœia*, which is quite strong enough for this purpose, and introduced by an ordinary stilette, armed with a piece of absorbent cotton saturated in the application, and passed through the dilator so as to avoid any of the acid being brushed off in the canal until it reaches the fundus vesicæ, where it should be

retained for a couple of minutes, until every part of the vesical wall contracts firmly upon it. The urethral canal is then to be similarly brushed out by another application of the carbolized glycerine. The pain caused by this procedure may be prevented by previously introducing in the same way a ten per cent. solution of cocaine. This plan of treatment now recommended seldom requires to be repeated more than two or three times, at intervals of a week, to effect a cure of even the most aggravated cases of cystitis in women.—*British Med. Journal*, March 2, 1889.

For Fissured Nipples.—

℞ —Cocaine . . . . . grs. x.
Lanoline . . . . . ℥j.—M.

To be applied once or twice daily. The ointment to be washed off before nursing.—*New York Medical Journal*, March 9, 1889.

Phenacetine and Antipyrine.—PROF. MASIUS, of Liége, has communicated to the Belgian Academy of Medicine the results of a somewhat extended trial of phenacetine which he has been making in his wards during several months past. In fevers of all sorts a reduction of temperature could generally be obtained by suitable doses; usually a dose of from fifty to seventy-five centigrammes was sufficient for this purpose; it was found that the same effect could not be produced by smaller quantities, even when given repeatedly. Two grammes during the twenty-four hours sufficed to keep the temperature down. The patients said that they felt a great deal better as the temperature fell; the pulse, too, became slower and stronger, and appetite and sleep returned under the influence of the drug. M. Masius also employed phenacetine as an analgesic not only in rheumatic, but in various other cases, with considerable effect. He did not, however, find that in this respect it was equal to antipyrine. It has been claimed for phenacetine that it has several advantages over antipyrine, such as more rapid action and an absence of disagreeable secondary effects, but according to the experience of M. Masius, though it is true that the lowering of temperature is more rapid than with antipyrine, it is of much shorter duration, besides which there is a liability to the occurrence of rigors and cyanosis, and neither its antithermic nor its analgesic action is so well marked as that of antipyrine. It has certainly the advantages of not disordering the digestion and of being cheap.—*Lancet*, March 9, 1889.

Lanolin Ointments.—DR. E. STERN recommends in the *Ther. Monatsh.* for February, 1889, the following lanolin ointments, which in his hands have given most excellent results. The first one spoken of is *Sapolanolin* ointment, composed of lanolin two and a half parts, and sapo viridis two parts. With the exception of salicylic acid, all other preparations, such as boracic acid, tar, white precipitate, resorcin, etc., can be easily added to this mixture. In eczema, mycosis, and in cases of seborrhœa with strong crust deposits such ointments will be found of great service. The following is the formula generally used by the author in psoriasis capitis:

℞.—Ammoniated mercury . . 10 parts.
Green soap . . . . 40 "
Lanolin (anhydrous) . . 50 " —M.

The action of sapolanolin with ammoniated mercury when applied to the head is as efficacious as chrysarobin upon the body. After having continued its use from three to eight days all signs of scurf will have disappeared, the affected portions will appear smooth and white and the application of some lanolin cream and daily washing with soap and water is all that will be required to give to the scalp its normal appearance. Discoloration of the skin was never observed. The author uses the following paste, which will adhere to the skin without any bandage:

℞.—Cold cream } . āā 40 parts.
Lanolin (anhydrous) }
Benzoated olive oil . . 20 " —M.

This forms a yellow ointment which permits of being applied to the face in thick layers. It is very adherent, wherefore the term unguentum adhæsivum would not seem out of place. To it can be added any other medicament. Should tar be added, the quantity of wax must be increased. The author uses this paste alone or in combination with boric acid and oxide of zinc in all cases in which the application of an ointment and bandage might prove of some difficulty, as for instance in the facial eczemas of children. This paste answers in these cases the purpose of maceration and of a new epidermis, so that at the end of eight or fourteen days the tar treatment may be commenced. In the squamous and vesicular varieties of eczema the addition of salicylic acid to this paste will be found of the greatest service:

℞.—Salicylic acid (finely powdered) 3 parts.
Olive oil . . . . . 17 "
Cerate } . . . āā 40 " —M.
Lanolin }

For urethral injections the author prescribes the following:

℞.—Lanolin (anhydrous) . . 25 parts.
Almond oil . . . . 75 " —M.
(Basis-injection.)

or

℞.—Sulphate of zinc . . . 1 part.
Water . . . . . 9 parts.
Lanolin (anhydrous) . . 40 "
Almond oil . . . . 150 " —M.

or

℞.—Salicylic acid . . . . 1 part.
Almond oil . . . . 300 parts.
Lanolin (anhydrous) . . 99 " —M.

The injections are made with an ordinary syringe, the injected material being held from five to ten minutes in the urethra; its action is mild and not irritating. After twenty-four hours fat particles are found in the urine and this long retention accounts for the favorable action of this remedy upon the gonorrhœic processes. At the end of eight to ten days the author adds an antiseptic or astringent remedy to the injection, and ends the treatment with injections of a one and a half per cent. resorcin solution in water. Also in chronic urethritis lanolin injections are of great service.—*Wiener med. Presse*, Feb. 24, 1889.

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TREATMENT OF APOPLEXY DUE TO HEMORRHAGE FROM THE MIDDLE CEREBRAL ARTERY BY COMPRESSION OF THE CAROTID.

IN the *British Medical Journal* of March 2, 1889, is an extremely interesting report to the Scientific Grants Committee of the British Medical Association, by MR. WALTER G. SPENCER and PROF. VICTOR HORSLEY, suggesting that in cases of apoplexy (especially of the ingravescent form) which usually arise from hemorrhage of the middle cerebral, or its branches, that compression of the common carotid shall be employed as a means of arresting the hemorrhage, and of preventing the more serious consequences that would follow its continuance. Of course, in cases of hemorrhage from the middle cerebral, or from any other intra-cranial artery, arising from violence, in which the site of the hemorrhage could be ascertained, the proper treatment would be to open the skull and secure the vessels just as in any other part of the body. But this paper does not regard the question of traumatic hemorrhage, but of hemorrhage from apoplectic causes.

Clinically, such cases may be divided into three classes: *First*, those in which so much blood is poured out that death is immediate. *Secondly*, those in which the hemorrhage is so small that it ceases immediately. In neither of these would the proposed method of treatment be applicable. The *third* class of cases are those in which the hemorrhage is moderate at first, and continues for a longer or shorter time, during which the severity of the symptoms gradually increases, these symptoms being spasms followed by paralysis, dilatation of the pupils on the same side as the hemorrhage, and general signs of compression of the brain, followed by mechanical asphyxia and death.

The paper follows three lines of thought. First, anatomically, there is a sharp distinction between the relation the middle cerebral artery bears to the carotid, and the relation which the arteries forming the circle of Willis bear to the same vessel. The middle cerebral is not a part of the circle of Willis, but is the direct continuation of the carotid, ascending almost vertically in the fissure of Sylvius, and dividing into several branches which supply the ganglia at the base of the brain and the internal capsule. One of these—the lenticulo-striate artery—is again the most direct continuation of the middle cerebral, and is so much more frequently the site of lesions causing apoplexy that Charcot has well called it the "artery of cerebral hemorrhage." The circle of Willis, on the contrary, lies almost in a horizontal plane instead of a vertical one. Its vessels are not the direct continuation of the carotid, but are almost at right angles to its general axis, hence, the force of the blood is spent chiefly on the middle cerebral and its branches, instead of on the circle of Willis.

Secondly, pathological observations as to the site and the frequency of intracranial hemorrhages exactly tally with these *a priori* conclusions drawn from the anatomical disposition of these arteries.

Thirdly, Spencer and Horsley have now added experimental results of extreme interest and importance. The cerebral circulation in the Macaque monkey differs very much from that of the dog, rabbit, or horse, and is arranged on the same plan as in man. The animal having been etherized, the skull over the area supplied by the middle cerebral artery removed, and the dura raised carefully, the condition of the circulation and the pulsation of the vessels were first noted. The carotid on the same side was then compressed through the tissues of the neck against the vertebræ. Immediately the pulsation in the branches of the middle cerebral ceased. The vessels were not entirely emptied, but no pulsation could be seen even in the largest of them, and the cortex became distinctly paler. Relaxation of compression was followed by return of pulsation. This was repeated again and again with the same result.

Another series of experiments showed the effect of cutting off the blood supply. When a motor area is stimulated repeatedly by a Faradaic current the functional activity of that area becomes gradually exhausted, so that the minimal current which will produce movement has to be increased until at last even the maximum current is followed by no movement and complete exhaustion has been produced. Spencer and Horsley selected the centre for the angle of the mouth. When the blood supply was cut off the excitability was practically and immediately lost, but gradually returned as the circulation was restored. If compression of the carotid be continued for a considerable time, the anastomosing vessels of the circle of Willis gradually fill the middle cerebral and its branches, and the authors found that, two hours after ligation of the common carotid, pulsation in the middle cerebral was slight but not well marked, and the natural color of the cortex had been restored. When the corresponding cortical areas were then stimulated they reacted normally to minimal currents. Sudden or acute compression of the carotid, therefore, cut off the blood supply to the cortex and abolished its excitability for a time; but after the circulation had been gradually restored by anastomosis the cortex again became functionally active. This explains the immediate but temporary paresis of the face, arm, and leg which has occasionally been seen after ligation of the common carotid. Of course, the later cerebral symptoms noticed in about one-fourth of the cases, a day or two after the operation, cannot be referred to this cause, but are referable, the author thinks, to septic inflammation. While this is sometimes true, it is certainly not always the explanation. In some cases at least it is due to degenerative changes from insufficient blood supply. In cases of an insufficient anastomosis through the circle of Willis this may go so far as to produce necrotic changes.

Another interesting series of experiments—indeed the crucial ones—was made as follows: A large portion of one hemisphere of the cerebrum was exposed and a ligature was passed under the common carotid but was not tied. A rapid horizontal incision was then made in the hemisphere, so as to cut across the main trunk of the middle cerebral, the lenticulo-striate, and a number of other branches of the same artery running vertically upward, especially through the lenticular nucleus. The upper border of this incision being lifted, showed the middle cerebral and lenticulo-striate artery bleeding freely. Compression of the carotid immediately caused cessation of the bleeding. The small branches stopped usually at once, but the middle cerebral first stopped pumping, and then oozed freely. Soon the hemorrhage was arrested by a clot which, in from one-half to three-fourths of a minute, stopped all hemorrhage from the middle cerebral itself. Compression of the carotid was maintained two minutes and then released. The middle cerebral pulsated plainly under the thin clot covering its mouth, but no recurrence of the oozing ever occurred. The clots were then raked from the mouths of the vessels, which began to bleed as freely as before, when renewed compression was followed by renewed arrest of the hemorrhage. This could be repeated again and again. If the carotid was compressed before cutting the vessels across, only oozing occurred. This stopped as quickly as before. Raking the clots from the mouths of the vessels, the carotid being still compressed, only slight oozing took place, and was speedily arrested.

The authors propose that persons who are instructed in "first aid" to the injured should be taught to compress the carotid in cases of supposed apoplexy. They point out that the only confusion of a diagnostic character likely to occur would be between apoplexy and embolism or thrombosis; but very properly they call attention to the fact that compression of the carotid would not have any unfavorable influence in case of such a mistake in diagnosis. It is, however, chiefly to physicians that we must look for the use of this method of arresting cerebral hemorrhage or of limiting its ravages. The authors propose that, if time and opportunity allow, the carotid might be temporarily compressed by exposing it, passing a stout ligature under it, and then drawing the vessel against the finger by the ligature. In such a procedure the wound must be kept aseptic, of course, and the pressure must not be sufficient to injure the internal coat. Certainly, however, we cannot expect that many cases will give time, opportunity, and an antiseptic surgeon for such operative procedure, and the usefulness of the proposed compression of the carotid will be limited to a very small number of cases most favorably situated. It is a very possible thing, however, that in some cases of very severe hemorrhage or of high vascular tension, as well as in other directions as yet uususpected, that these very interesting experiments may bear fruit. In another class of cases we would suggest that occasionally temporary compression of the carotid may

be of value, viz., in those cases of intense headache in which apoplexy is threatened, or in which the patient's discomfort is extreme. Not only, however, does compression of the carotid influence the circulation in the brain, but, as the late Prof. S. H. Dickson frequently showed his friends in his own person, by compression of the carotid he could at will reduce his pulse at least twenty beats in the minute—a result that followed the compression almost immediately. Probably, however, this was a personal idiosyncrasy; but it is one worthy of further investigation.

SULPHONAL.

So much has been written and said in society meetings as to the value of sulphonal as a hypnotic, that it would seem to be impossible to add anything more to the subject, save by reporting more cases in which it has done good. One of the best summaries of all that has been done has been gathered together by KRONFELD and LÖWENTHAL of Prof. Meynert's clinic, and, in addition, they detail quite a number of cases for themselves in the *Wiener klinische Wochenschrift* of January 10, 1889. Their patients seem to have suffered from almost everything that can produce sleeplessness, from old age to uterine cancer, a very large number of nervous cases being included, of a functional and organic character. The drug was given at about seven in the evening, and nearly always with the effect of causing sleep.

In *Nouveaux Remèdes* of January 24, 1889, are given the records of a meeting of the Société de Thérapeutique, held on January 8, 1889, at which CONSTANTIN PAUL stated that sulphonal was the equal of chloral, and that it produced sleep with unusual speed and certainty. The report of HUCHARD was not so good, for while he found that it quieted patients, they did not always sleep, and this was so particularly in phthisis. He believes it to have little if any analgesic properties, and that the sleep produced generally lasts from four to eight hours after large doses. Huchard asserts also that it produces its most agreeable effects in essential insomnia. He does not believe that it is superior to chloral.

IT is stated that the Board of Regents of the University of Michigan will ask the State Legislature for $50,000, to which will be added $25,000 by the city of Ann Arbor, for a new hospital building, with a view to increase the clinical facilities in connection with medical teaching at the University.

THE fortieth annual meeting of the American Medical Association will be held at Newport, R. I., on June 25th, 26th, 27th, and 28th, under the Presidency of Dr. W. W. Dawson, of Cincinnati. Dr. Horatio R. Storer, of Newport, is Chairman of the Committee of Arrangements. In connection with the meeting there will be held an exhibition of medical books, appliances, drugs, etc.

THE annual session of the Medical Association of the State of Mississippi for the current year, will be held in the City of Jackson, commencing on April 17th, at noon, and continue three days.

THE South Carolina Medical Association will hold its next annual meeting at Charleston, S. C., on Wednesday, April 24, 1889. An address will be delivered by Dr. Robert Battey, of Rome, Ga.

THE Lomb Prize Essay on "Practical Sanitary and Economic Cooking for Persons of Small Means," has been awarded by the American Public Health Association and will soon be issued, the value of the prize this year amounting to $500. The Secretary of the Association writes that the prize committee regard the essay as of unusual merit, and asks that it be not unfavorably prejudged by those who have seen the mutilated reprint of it in one of the daily papers of New York City.

THE Royal Medical and Chirurgical Society, of London, has just purchased a large house in Hanover Square, which is said to be admirably adapted to the Society's wants. The property will be at once altered, and in all probability before the end of the year the Society will abandon its old quarters in Berners Street for its new and more commodious building. The Society's library now numbers 31,320 volumes.

THE Emperor of Austria has conferred on Pasteur the order of the Crown of Iron, which gives him the right to the title of Baron and the insignia of nobility.

A CABLEGRAM from the Hague, dated March 25th, announces the death of PROFESSOR FRANCIS CORNELIUS DONDERS, the eminent ophthalmologist, aged seventy-one years. Donders was born at Tilburg in Brabant, May 27, 1818. He studied medicine at the Military Medical School at Utrecht, became

military surgeon at the Hospital of the Hague and afterward professor at the Utrecht school. Called to the University of the same city, he was successively professor of histology and physiology, and then of ophthalmology, to which was added the clinic of diseases of the eye. In 1863 the government voted him a sum of money to construct a physiological laboratory corresponding to the needs of modern science. His researches on the "Anomalies of Refraction and Accommodation" placed this most important branch of ophthalmology upon a scientific basis and gained for its author a world-wide reputation. Donders was elected a member of the Institute of France in 1879, and he was also a member of many of the scientific societies of the world.

SOCIETY PROCEEDINGS.

NEW YORK ACADEMY OF MEDICINE.

Stated Meeting, March 21, 1889.

THE PRESIDENT, ALFRED L. LOOMIS, M.D., IN THE CHAIR.

DR. M. ALLEN STARR read a paper on

THE PHYSICS AND PHYSIOLOGICAL ACTIONS OF ELECTRICITY.

(See page 339.)

DR. LANDON CARTER GRAY then spoke on

THE EFEECTS OF ELECTRICITY IN CENTRAL NERVOUS DISEASES.

Before commencing, he stated that theoretically he entirely agreed with Dr. Starr in the position that he took, but as to practical results he differed very greatly from him, since he had reason to be well satisfied with those he had met with in sixteen years of daily experience. Dr. Starr had said that electricity could by no means be administered with the same certainty of effect as opium, for instance, but his experience had taught him that it could. In certain conditions he was just as confident of securing relief by the use of electricity as in others he might be by the employment of opium or quinine. Among them might be mentioned some forms of neuritis and of neuralgia of the trunks and extremities, some simple forms of neurasthenia, and also certain morbid symptoms of some of the organic diseases, although he would not have it understood that he claimed to cure the organic disease itself by this means. A great deal depended, he thought, on the way in which the electricity was administered, and he had never yet seen a dispensary which was properly equipped with apparatus for its careful and scientific use. Among the essentials requisite for this cure were a more or less constant cell (an absolutely constant one could hardly be obtained), a milliampèremeter, and a rheostat. Until within quite a short time the employment of electricity in America had been almost entirely empirical.

He had been in the habit of employing electricity in two classes of central diseases: *first*, the insanities, and, *second*, gross diseases of the brain. In the insanities which he had designated as functional, it had proved of great service in the convalescent stage, but he never employed it in the acute stage of such affections. Among the forms of insanity in which it was beneficial were melancholia, mania, etc. In speaking of the use of electricity in gross diseases of the brain, he referred particularly to intra-cranial syphilis. In the early stage of headache, before paralysis occurred, it was often very useful; as sometimes also in the later stages, after the occurrence of hemiplegia. In *tic douleureux* its action was somewhat uncertain, but its employment was sometimes attended with benefit. He wished to state, however, that he had no faith in the value of static electricity, except as regards the moral effect of its application in certain hypochondriacal cases or others where a strong mental impression was desirable.

The insanities were concerned only with intra-cranial conditions, and were best treated by means of galvanism. The gross disease of the brain, on the other hand, had two great classes of symptoms, *first*, cerebral, and, *second*, those both cerebral and peripheral. For the cerebral symptoms galvanism was best adapted, and for the peripheral, faradization. In employing central galvanization great care should be used to avoid anything like a shock or the production of flashes of light; and from one to two milliampères was usually all that could be comfortably borne by the patient. At first the sittings should not last more than three minutes, and in discontinuing the application the current should always be very gradually diminished. In applying faradization for peripheral symptoms the motor points could be readily picked out. The question naturally arose: Which pole of the battery should be used? It was an unquestionable fact that there were marked chemical and physiological differences in the action of the two poles, but as to their practical effects in the system from a therapeutic point of view, he was free to confess that he had never been able to convince himself that there was any advantage in one over the other. The only rule that he could lay down was, that if one pole did not suit the case, try the other, and if the other produced no better result, to abandon the use of electricity altogether.

In general paresis electricity was of no service, but in some cases of cerebral syphilis, where the symptoms were difficult to distinguish from those of general paresis, it was often of great benefit. In cases of hemiplegia without contracture it was also beneficial.

DR. W. R. BIRDSALL spoke of

THE EFFECTS OF ELECTRICITY IN DISEASES OF THE SPINAL CORD.

As to organic diseases of the cord, he said that he agreed with Dr. Starr in his doleful picture, only he could apply it to other therapeutical means as well as electricity, and consequently he thought the statements of the paper were an injustice to the latter agent. When we considered the condition present (this being a class of diseases that were practically incurable), we should not expect too much. Like Dr. Starr, he had never seen a case of such organic disease cured by electricity; but he would go further, and say that he had never seen a case cured by any other means. But at the same time he had

often seen the use of electricity attended with good effects in these cases. We had to treat the symptoms, the pain, the spasm, the paralysis; but as to removing or shortening the process underlying the symptoms, it was certainly difficult to point to any agent whatever that would accomplish this result.

The rule might be laid down that electricity is not to be resorted to in any acute inflammatory condition. Here it was liable to do harm, instead of good, and, as a rule, it should not be employed in inflammatory affections at all. As to the effect of electricity upon the system, it seemed to him that it was that of a stimulus. While clinical experience appeared to favor the idea that we can accomplish more with the anode than with the cathode, practically he thought there was but little difference between the two. In using electricity in any form, it was important that both the immediate and the after effects should be taken into consideration, and he believed that we really know more about the effects of this agent than even about those of the most familiar drugs. But neither in the case of drugs or of electricity could we always tell what the ultimate effects would be on the system.

He believed himself that a large share of the electricity was reflex in character. For this reason an argument could not be raised against the use of statical electricity because its local action was superficial, and he considered it an agent of decided force. When we come to consider the effects of electricity upon the spinal cord, he agreed with Dr. Starr that by the ordinary means of applying it only full currents acted upon the cord; yet, at the same time, he could not doubt that powerful effects often resulted. It was a fact that when one electrode was placed at the nape of the neck and the other upon the arm, and a current of twenty milliampères was used, a flash of light could be produced; showing that the optic apparatus had thus been indirectly affected. The tissues of the head were thus implicated, although the current did not pass directly through them. The resistance of the skin to the passage of the current was greater than that of any of the other tissues. The main effects on the spinal cord, he believed, were the peripheral effects. In tabes he had seen relief from pain to a moderate degree afforded by electricity, but had never known any effect to be produced upon the ataxia. In certain cases, however, he had seen some improvement in spastic conditions, and in this connection he referred to a case where the spastic condition followed upon transverse myelitis. The best effects were noticed in instances where the structural changes were not complete, and the nutrition of the muscles was not too greatly impaired. In facial paralysis and head paralysis, he had often seen great improvement take place under the use of galvanism. The principal effects to be hoped for from electricity were improvement of paretic conditions, relief of pain, relief of spasm in certain instances, and the benefiting of functional derangements.

DR. A. D. ROCKWELL then read a paper on

THE EFFECTS OF ELECTRICITY IN PERIPHERAL NERVE LESIONS.

The best results from electricity, he said, are met with in functional disorders; but even here discrepancies are often met in different cases, and a brilliant result obtained in one patient might be followed by comparative failure in another apparently suffering in the same way. Facial paralysis was among the more important peripheral nerve affections, and in a large number of cases he had seen great benefit derived from electricity. In others, however, he had been disappointed in his results. It was proper to inquire, therefore, (1) Does electricity sensibly hasten recovery in peripheral nerve diseases? and (2) in what cases is it to be tried? In many cases of diminished farado-muscular contractility with increased galvano-muscular contractility but little benefit was derived from electricity. As to facial paralysis, if the portion of the nerve external to the Fallopian canal alone were affected, marked relief would be apt to attend the use of electricity; but if the portion of the nerve lying within the bony canal were compressed by inflammatory products not much could be expected from it. In diphtheritic paralysis he had often found it of very great service.

DR. E. D. FISHER read a paper on

THE EFFECTS OF ELECTRICITY IN FUNCTIONAL NERVOUS AFFECTIONS.

In functional disorders, he said, we had to assume a molecular or fine nutritional change, and in electricity we had an agent which acted as a stimulant to the normal functions when these were functionally deranged. In this class of affections much, then, could be accomplished by it, and it was to experience that we look in order to appreciate its true value. In static electricity, with which he had had considerable practical experience, we had an agent ordinarily well adapted to stimulate the surface, and he had found it of considerable service in the treatment of such conditions as cerebral and spinal neurasthenia, chorea, etc. While faradization was also often of advantage, the greatest benefit to be derived in this class of cases in general was from galvanization. Physiological data, borne out by clinical data, would seem to sustain the positive value of electricity in functional diseases.

He would not discard the use of statical electricity altogether, as he believed it had its place in the list of therapeutic agents of advantage in functional diseases, where the trouble was nutritional, and not organic.

DR. M. P. JACOBI made some remarks on the treatment of uterine fibromata by means of electricity, and said that he had been very much disappointed in trying to get out accurate statistics from which some definite conclusions as to the value of this method might be based. In the report of the hundred cases of Apostoli published four years ago there was much that was open to criticism. The data given were often meagre and unsatisfactory, and all the cases were reported cured as the symptoms were relieved. Keith, who was so impressed by the results of Apostoli's treatment which he observed in Paris that he stated that he would never advise laparotomy in any case of this kind until a thorough trial of electricity had been made, reported that he had made twelve hundred applications in one hundred cases, the majority of which were fibroids. He did not, however, give any accurate statistics, but merely stated that the tumors were reduced in size and that the cases were mostly relieved. After Apostoli and Keith the largest number of cases had been reported by Everett in the *New York Medical Journal*, in the paper which was doubtless familiar to

all present. There were seventeen cases in all; but six of them were either situated very near the mucous membrane or else were polypi. Faradization and galvanism were employed until the tumors protruded into the uterine cavity and they were then removed by operation. Another series, of sixteen cases, was reported by Webb, an Englishman, and three of these, which were of remarkable interest, he mentioned particularly. All Webb's cases were treated with galvano-puncture, although the procedure differed materially from that advocated by Kimball and Cutler some years ago. The puncture was always made through the fornix, and the needle was inserted but a short distance. In addition, galvano-cauterization of the interior of the uterus was practised.

DR. GEORGE W. JACOBY looked upon the whole subject of electro-therapeutics very decidedly from the standpoint of Dr. Starr in his paper. In employing electricity we are dealing with physiological effects of which we know very little. When one good observer told us that he had seen cures in certain diseases produced by it, and another equally good observer told us that he had never seen any benefit derived from it in the same affections, it was certainly difficult to arrive at any positive conclusions regarding the utility of this agent.

DR. L. PUTZEL said that the great trouble was that we do not take into account the natural history of the diseases in question. He agreed with Dr. Starr in the main, although he did not believe that the latter would wish that his paper should be regarded as a full statement of his views. He certainly did not believe that electricity could cure organic troubles, but at the same time he thought there could be no doubt that it often did relieve symptoms. Dr. Gray had expressed the opinion that the reason that better results with electricity were not obtained by many, was because it was given empirically; but in the present state of our knowledge he did not think it could be used in any other way. In order to get some idea of the practical value of electricity, we should compare cases treated by electricity with the same class of cases treated by other remedies, and left untreated. There was one point which rendered it difficult to say just how far any benefit observed was to be attributed to electricity, and this was that no disease was treated with electricity alone.

In the treatment of varicose veins he had found that the faradic current was of very great practical benefit. This he had discovered accidentally in a case of hemiplegia; and while the hemiplegia, for which the electricity was employed, remained unimproved, the varicose veins were cured by it. In this affection a good result might be expected if the veins were not too sinuous or not too greatly dilated. In applying the current it was his practice to begin at the lower part of the leg.

DR. JOHN H. GIRDNER believed that the electrical condition of the body in health and disease was a matter of great importance. In the action of the instrument which he had described two years ago for detecting the exact location of a bullet or other metallic substance embedded in the tissues, there was, he believed, a distinct electrical current taken from the body. More recently he had substituted for the telephone an electrometer, and for the probe another cell. He then exhibited zinc and copper rods adapted for introduction, the one into the mouth and the other into the rectum, to which wires could be attached, and said that by means of this device he had succeeded in getting a current from the body of the strength of one-fifth of a milliampère. He had thought at first that this electrical action might be due to the fact that one of the cavities into which the rods were introduced was acid and the other alkaline in reaction; but subsequent experiments had demonstrated that the current was produced entirely independent of the chemical reaction of the oral and rectal cavities.

In health, therefore, he believed that there was a constant electrical condition of the body, since by the means indicated we could undoubtedly develop a current which could be measured. He was convinced, also, that this electrical condition was different from what it was in health; or, in other words, that the electrical condition varied in health and disease. When we are able to ascertain just what these varying conditions were, we might perhaps be able to introduce into the system some kind of current that would be directly beneficial. This was a subject in which he was deeply interested, and in regard to which he was at present pursuing investigations which he hoped at some future time to embody in a paper to be presented to the Academy. He would only say, in conclusion, that he believed the time would come when in the treatment of disease it would be regarded as important to know the electrical condition of the body as it was to know the temperature.

DR. PETERSON said that for some time past he had been engaged in a series of experiments having in view the production of local anæsthesia by the introduction, through the cataphoric action of electricity, of cocaine and aconitia into the subcutaneous tissues. In many of the severer forms of neuralgia of the peripheral nerves which resisted other means of treatment he had used this method with decided benefit. By means of it he had succeeded in securing complete relief from pain for from five to eleven hours at a time. He did not believe, however, that it had any curative action, its effects being merely palliative.

DR. WILLIAM H. THOMSON said that the difference between the galvanic and the faradic current was, in his opinion, very material. The one possessed a powerful chemical action, and the other did not. He agreed with Dr. Starr as to the feeble powers of the galvanic current. On the other hand, the faradic current had a powerful stimulating effect upon all the bloodvessels situated between the two points where the electrodes were applied. In head paralysis he thought there was nothing that would drive the blood directly into the small muscles like the faradic current properly applied. The utility of this current in promoting absorption was also very great, as pointed out many years ago by Graaf and Langenbeck, the latter of whom used it with the most happy effects in an adenoid tumor of the neck. In his hands it had proved of the greatest possible service in the removal of exudations, and he constantly employed it in such affections as chronic muscular rheumatism, enlargement of the liver and spleen, and chronic effusion into the pleura. He should be very sorry, he said, to have his faith shaken in the efficacy of electricity in promoting absorption.

DR. ANDREW H. SMITH said that there was one condition in which he had found static electricity more promptly efficacious than any other agent with which he was acquainted, and that was muscular stiffness from exposure to wet or cold. Usually one application was

all that was required for its complete relief; but occasionally a second application was necessary. In regard to Dr. Girdner's device for procuring an electrical current from the body, he believed that the explanation of the production of the current was simply that a cell was created within the body by the means employed.

DR. STARR, in bringing the discussion to a close, said that it seemed to him that the discussion had been unfavorable to many of the claims for the use of electricity made by many of the text-books. Gowers was the first to express the truth in regard to the effects of this agent, and he believed that he was entitled to credit for the bold and candid position that he had taken. While some of the speakers had taken a different view, there had been a pretty general consensus of opinion that these claims of cures by electricity were greatly exaggerated and without any adequate basis in fact; and he believed that this consensus would have weight with the profession at large as coming from this Academy. It was time that our physicians knew the truth about the matter, for patients were constantly being sent to this city at great expense and inconvenience expressly to be treated for electricity, when they could be just as efficiently treated by other means at home.

He thought that one very important point had been acknowledged by Dr. Gray, and that was that we do not know any therapeutic difference between the two poles. As it was a well-established fact that there was a very material difference in their chemical and physiological action, it seemed to him that the fact that there was no difference between them therapeutically showed that electricity was of but little value as a remedial agent. As to hemiplegia not followed by contracture, which Dr. Gray had claimed to cure by electricity, this was a condition in which recovery always occurred in the course of time, whether any treatment was adopted or not. It was acknowledged by all, however, that the growth and nutrition of muscles were promoted by electricity, whether of the galvanic or faradic variety; and this was well illustrated in the case of Dr. Thacher's to which he had referred. Diphtheritic paralysis, which Dr. Rockwell said could be cured with electricity, was another form of paralysis which always recovered of itself.

He wished to take exception to one statement made by Dr. Rockwell, viz., that faradic electricity acted on the intra-muscular nerves and that galvanic electricity acted upon the nerve trunks, and hence that a degenerated muscle failed to act to faradism. Both currents act on both parts. There is no essential difference in their action. But the reason faradism fails to act on a degenerated muscle is *not* because the intra-muscular nerves are diseased, but because the rapidity of the change of electrotonic state is too great in the faradic battery to elicit the contraction in a degenerated muscle or nerve. If a single shock of a faradic battery alone be given to a degenerated muscle it will react just as it does to an interrupted galvanic shock. It is the rapid alternation of shocks usually produced in the faradic apparatus to which the muscle is incapable of responding.

Dr. Fisher had also made two statements from which he must positively dissent. He had said that the nervous system was the best conductor; on the contrary, it was a very poor conductor. Again, he had said that the sympathetic was very easily affected by electricity; while, in reality, it was very difficult to do so, requiring a current of great strength, as was proven by the difficulty in producing pupillary contraction by galvanizing the cervical sympathetic. He agreed with Dr. Jacoby that it was very difficult to judge between different observers when their experiences were directly contrary to each other. Under these circumstances the consensus of opinion alone can decide. He was entirely willing to acknowledge the power of electricity in absorbing exudates, referred to by Dr. Thomson. Anything which would increase the circulation and improve the nutrition of the part would prove of service in this respect. He believed, however, that Dr. Thomson would get better results if he would employ the galvanic instead of the faradic current for the object named, since its catalytic action would aid the process. Dr. Starr agreed with Dr. Smith as to the explanation of the electrical current produced in Dr. Girdner's experiment.

PHILADELPHIA NEUROLOGICAL SOCIETY.

Stated Meeting, January 28, 1889.

THE PRESIDENT, S. WEIR MITCHELL, M.D., IN THE CHAIR.

DR. F. X. DERCUM reported the following case of

SUPRA-DURAL HEMORRHAGE.

The patient was a man, thirty to thirty-five years of age, brought to the Philadelphia Hospital early one morning in December by the police patrol, he having been found lying upon an open lot. He was totally unconscious: temperature subnormal, registering at one time 95°; face flushed and dusky; breathing labored and stertorous, and at times resembled the Cheyne-Stokes respiration. The lips and cheek of the right side were puffed in and out and the right nostril dilated. The left side seemed normal. The mouth was not distinctly drawn. Both hands and arms were firmly flexed and crossed over the chest. They were decidedly rigid. The legs were also fixed in extension with some turning in of the feet. The head was turned to the right, a marked effort being required to rotate it toward the opposite side. The right pupil was widely dilated, while the right eye was directed outward, as though held there by spasm of the external rectus. The left pupil seemed unaffected. Both were insensitive to light. No response was evoked by irritating the conjunctivæ, and this was also true of the skin over the entire body. The arms could be partially extended, and occasionally jerking movements were observed in them.

The patient vomited freely, the ejecta smelling decidedly of whiskey. The urine, obtained by the catheter, contained no albumin. The pulse was weak and intermittent. A small scratch or abrasion was found to the right and above the occipital protuberance. It had bled little, if at all, and seemed very insignificant. No bleeding had occurred from either the ears or nostrils. The man's condition remained unchanged for several hours, but he gradually grew weaker as the day progressed, and finally died.

Autopsy: Beneath the bruise previously observed the inner surface of the scalp and the periosteum were ecchymosed. No fracture of the skull was, as yet, apparent, and no depression existed. On removing the calvarium, however, and examining its inner surface, a fracture was

detected beginning a little in front of the lambdoid sutures and extending obliquely outward across the serrations of the latter. It was evidently a fracture of both tables, and on the outer surface was now observed to be about an inch in length and linear in shape. The fracture of the inner table was much more extensive. It extended in three directions, the most complete break being along the line of the lambdoid suture.

Lying upon the dura an immense clot was found upon the side of and beneath the fracture, and situated over the lateral aspect of the superior and inferior parietal lobules, the first and second temporal convolutions, and the anterior extremity of the lateral aspect of the occipital lobe. The anterior limit of the clot was about one-half to one inch back of the fissure of Rolando, while its posterior limit was from one-half to one inch from the apex of the occipital lobe. In its middle portion the clot was fully an inch, if not more, in thickness.

An examination of the base of the brain revealed numerous ecchymotic spots and areas in the pia and arachnoid. Similar appearances were observed in the brain almost everywhere. No hemorrhage existed in the ventricles or ganglia. On the ventricular surface of the right caudate nucleus was an area of very superficial yellow softening one-half inch in length, one-fourth inch in breadth, and three or four lines in depth.

The fact of the limbs being rigid in contraction suggested semi-conscious resistance, and also the fact that the man was vomiting matter smelling of whiskey suggested that he was drunk. He undoubtedly was drunk in addition to having the extra-dural hemorrhage. The diagnosis was also complicated by the presence of specific scars over his person, thus suggesting a specific cause for the inequality of the pupils. I, however, could not free my mind from a suspicion of hemorrhage. I thoroughly examined the scalp, but did not feel at the time that the slight scalp wound was sufficient justification for trephining, but I think now that exploratory trephining would certainly have been rewarded. In explaining the symptoms in this case, it seems to me that the absence of hemiplegia was due to the fact that the clot was not directly over the motor area. The general rigidity is, probably, to be explained by irritation of the dura. The dilatation of the pupil was probably due to direct pressure.

DR. CHARLES K. MILLS saw this man for a few minutes on the morning that he was admitted, and expressed the opinion that the case was one of hemorrhage. The case is an important one, as it clearly confirms the diagnostic marks of Jacobson and others for supra-dural hemorrhage. Looking over the cases which he had collected for the paper read at Washington, he found a number in which the symptoms correspond somewhat closely to those described to-night. The dilatation of the pupil—the oculo-motor paresis—is so common that Jacobson suggests that it be called Hutchinson's pupil. it having first been described by that observer. He examined the oculo-motor nerve very carefully in this case at the autopsy; it did not differ from the other nerves at the base. He, therefore, thought that the dilatation of the pupil was the result of pressure. A considerable amount of pressure would be exerted on the entire hemisphere, and a clot in the position indicated might possibly cause paresis of the oculo-motor nerve by counter-pressure. He believed that in a case presenting these general symptoms, with paresis on one side, and suspected injury' even without the external evidences present here, we would be justified in trephining over the parietal lobe, as has been done by Kronlein and others in such cases.

HEMORRHAGIC PACHYMENINGITIS.

DR. FRANCIS X. DERCUM, in a series of seventy-seven autopsies, the records of which, and the specimens of membranes of which he went over very recently at the Insane Hospital at Norristown, found twenty-eight cases presenting hemorrhagic pachymeningitis. In these twenty-eight cases there were four in which there were gross lesions, that is, there were large hæmatomata; in the others, there were fibrinous patches. Some of the patches were stained very slightly, while others were quite dense and heavily stained; all were more or less stained.

The frequency of the occurrence of this affection in the chronic insane is exceedingly interesting, and suggests that this hemorrhagic or *fibrinous* pachymeningitis, as it is perhaps better called, is an inflammation, so to speak, normal to the dura—*i. e.*, if we have a simple inflammation of the dura, it is always an inflammation with fibrinous exudation, with or without the formation of vessels. Looking over the recent publication of Hirt on nervous diseases, he found that, under the head of inflammation of the dura, in which he is supposed to consider only simple inflammation, he speaks only of internal hemorrhagic pachymeningitis, evidently considering this *the* inflammation of the internal dura, thus regarding all other inflammations as special forms.

DR. A. ESHNER, through the courtesy of Dr. Hirst, reported the following case of

HEMORRHAGE INTO THE CENTRUM OVALE OF THE POSTERO-FRONTAL AND PARIETAL LOBES.

E. L., an unmarried Englishwoman, aged thirty-three years, was admitted to the hospital December 18, 1888. She stated that she had been blind for three weeks. The ability to discriminate light remained. There was a moderate degree of anasarca, and examination of the urine disclosed a considerable amount of albumin, with hyaline and granular casts of the uriniferous tubules. On December 20th the external measurements of the maternal pelvis were made, the diagnosis of pregnancy confirmed, and the presentation and position established. The fœtal heart-sounds, however, were not detected. Upon the direction of Dr. Hirst, a hot-air bath was ordered, and the removal of the fœtus, which it was conceived was dead, was contemplated. Shortly preceding this examination, on December 20th, at about five o'clock in the afternoon, the woman developed a comatose condition, with stertorous breathing. She had sat up in a chair during the morning, had taken milk and medicine, and, in response to inquiries, had stated that she was feeling better than hitherto. The night before, she is said to have sat up in bed and combed her hair, though a neighboring patient observed convulsive muscular contractions of the arms and shoulders. Soon after the condition of coma was noticed, the patient was yet able to swallow and respond to calls. She made complaint of the disagreeable taste of the medicament which she was taking. She was given milk again at 9.30 P.M. and at 1.30 A.M., and medicine at 10.30 P.M. Urine was passed once, and the bowels moved twice involuntarily. She grew worse

during the night, and Cheyne-Stokes respiration set in. While preparations for a second hot-air bath were being made, at about 4.30 A.M., December 21st, the woman vomited a not large quantity of bloody fluid and expired. Unfortunately the nervous aspect of the case was not carefully studied. It is known, however, that the patient was able to move the right upper extremity until within a short time prior to death. On the night before, she appeared to have been oppressed by a sensation of subjective heat, as she removed the bedclothing from the chest.

The autopsy was made, under the direction of Dr. Mills, thirty-six hours after death. The only abnormal appearance on the surface of the brain was a large area of discoloration over the posterior part of the first and second frontal convolutions, at their junction, reaching, in the same plane, over the two ascending convolutions. On opening the right lateral ventricle, an irregularly shaped, longitudinal clot, about one inch or more in length, was found lying loosely in the cavity. This clot communicated with another, or with another portion of the same clot, which lay in a cavity which appeared to exist in the white matter external to and above the ganglia. Examination showed the ventricular surfaces of the caudate nucleus and optic thalamus entirely intact. The septum lucidum was not broken down, nor was there any blood in either the third or the left lateral ventricle. In fact, the entire left hemisphere appeared normal. A large section through the middle of the ganglia on the right side and the parietal lobe revealed a clot of the size of a lemon, confined to the white matter of the posterior frontal and parietal regions—the white substance of the corona radiating between the ganglia and the following convolutions: the posterior portions of the first, second, and third frontal, both ascending, and the superior and inferior parietal. Transverse sections in various situations through the ganglia showed no lesion. The ganglia were intact.

Hemorrhages into the centrum ovale and the cortex cerebri are relatively infrequent, though next in frequency of occurrence to those into the ganglia, which hold the first place.

Nothnagel, in Ziemssen's *Cyclopedia*, states that hemorrhages into the medullary substance may be wholly unattended with evidences of cerebral disease. In some cases an apoplectic seizure may occur, followed by complete recovery. In others there may be the usual evidences of hemorrhage, with or without apoplectic symptoms, followed by disorders identical with those following lesions of the corpus striatum. The symptoms of hemiplegia may be present and subsequently entirely disappear. This is perhaps the most characteristic feature of hemorrhage into the region under consideration.

Vasomotor disturbances and alterations of sensibility are sometimes present. Contractures are rarely noticed. The symptoms arising from affections of the centrum ovale bear the closest resemblance to those produced by disease in the corpus striatum.

Gowers states that hemorrhage into the centrum ovale causes symptoms similar to those due to a cortical lesion in the corresponding situation, but without the symptoms of irritation. Large hemorrhages usually spread into the centrum ovale from the corpus striatum. The vessels in the white substance are small and give only small hemorrhages.

DR. WM. OSLER said this case illustrates one of the conditions which in the pregnant woman may lead to hemiplegia or fatal hemorrhage. True apoplexy occurs most frequently in association with Bright's disease, and may come on during, or even be mistaken for, a uræmic attack. A specimen very similar to the one here shown is in his collection of brains in the Museum of McGill College—massive intraventricular hemorrhage. Rupture of a cerebral vessel during labor is, he believed, rare. A second more common event is embolism of one of the cerebral arteries during parturition. Aphasia is very often associated, and in a majority of the patients old mitral disease exists. In a limited number of cases a third condition is present—thrombosis of the cerebral vessels, due possibly to blood conditions which favor coagulation.

NEW YORK COUNTY MEDICAL ASSOCIATION.

Stated Meeting, March 18, 1889.

THE PRESIDENT, CHARLES S. WOOD, M.D., IN THE CHAIR.

DR. J. LEWIS SMITH read a paper on

THE CAUSE, MODE OF PROPAGATION, AND PREVENTION OF DIPHTHERIA.

Each year of recent investigation, he said, has strengthened the belief that the cause of diphtheria is a microbe; but it is still a matter of doubt which microbe is the causal agent, or whether there may not be more than one species of bacteria which by their action upon and in the tissues produce the disease. Having referred to the researches of Oertel (published in 1868 and 1874), Cohn, Eberth, Klebs, Senator, Billroth, Curtis and Satterthwaite, he said that the important observations and opinions expressed by Drs. Curtis and Satterthwaite in 1877 as the result of their investigation, under the auspices of the New York Board of Health, of the etiology and pathology of diphtheria, evidently prepared the way for the theory that the bacteria themselves are not the cause or the infectious principle of the disease, but that chemical substances, or ptomaines, produced by the agency of the bacteria, may be.

He then went on to speak of the more recent investigations of Wood and Formad, Klebs and Löffler, Cheyne, von Hoffman, Wellenhof, and Oertel; and stated that the latter, who was one of the earliest advocates of the theory of the microbic origin of diphtheria, now admits that the causative action of bacteria, though plausible, is not proven. The purpose of Oertel in his recent investigations has been to ascertain, if possible, the nature of the diphtheritic virus by a close and minute study of the lesions or anatomical changes which it produces; and the following is a summary of his present views. The nature of the virus is still obscure. It acts upon cells, causing their death and disintegration, and the infected particles convey the virus to other cells. The virus causes hyaline-degeneration in the tissues. The hyaline degeneration in the walls of the bloodvessels causes them to rupture, producing hemorrhages. The unequal amount of hyaline change in different parts of the vascular apparatus may be attributed to difference in resisting power or unequal exposure to the infected blood. Secondary inflammatory processes in the lungs, heart, liver, kidneys, and central and peripheral nerve-tissues must arise from the infec-

tious property of the blood circulating in them. He expresses the opinion that bacterial organisms cause diphtheria, and that they do so, not by their direct action, but by producing a ptomaine which infects the system and causes the disease to be constitutional. The microbe itself is mostly confined to the surface, where the action of the virus is widespread and deep. The most eminent pathologists of the present time, said Dr. Smith, do not express any more positive opinions in reference to the action of the specific principle or germ of diphtheria.

At the recent meeting of the London Epidemiological Society, Dr. M. W. Taylor stated his belief that common mould might sustain a causal relation to diphtheria, citing several instances which apparently favored this hypothesis. The theory that organisms which are commonly present in ordinary mould can produce diphtheria Dr. Smith thought improbable, however, since mould is common in all damp localities, where there is no diphtheria as well as where the disease is present; and he believed that the cases referred to by Dr. Taylor were explainable in other ways. The specific principle must be introduced from without, but if it obtain a lodgement upon the wet and mouldy surface of any filthy accumulation, it may find there a nidus favorable for its development. The fact appears to be fully established, as would be shown later on in the paper, that the diphtheritic virus is frequently propagated in foul and damp localities, apart from the animal tissues and independently of the sick. He repeated, therefore, that the theory of the causation of diphtheria which is gaining acceptance throughout the world is, that it is produced by a specific microbe or microbes, whose action is chiefly on the surface, or at no great depth, and that blood-poisoning occurs mainly from a ptomaine or ptomaines produced by microbic agency. In order to obtain a knowledge of the ptomaines, chemistry must aid microscopical investigations. During the past year Dr. T. Mitchell Prudden, whose care and trustworthiness in pathological research are universally recognized, has been making a series of elaborate investigations, the results of which will shortly be published in the *American Journal of the Medical Sciences*, and which seem to indicate the strong probability that the specific microbe of diphtheria is a streptococcus.

Mode of propagation. No fact is better established than that diphtheria does not arise *de novo*. Like the eruptive fevers, it is produced by the reception in or upon some part of the system of the preëxisting specific poison. The extreme contagiousness of diphtheria from person to person is well known, and the virus adheres tenaciously to objects on which it happens to alight. The clothing of a patient, even when the disease is of the mildest form, his bedding, the furniture of his room, and the objects which he handles may for weeks afterward communicate the disease. Dr. Sternberg, in his recent Lomb Prize Essay, also alludes to the fact that all damp, foul floors, such as sewers, cellars, and ill-ventilated spaces under floors, afford conditions favorable for the development and propagation of the diphtheritic virus. The virus, whatever its nature, once received, may be propagated in such a place for an indefinite time, and, ascending in the vapors which arise from this culture-bed, it is liable to communicate the disease to anyone who inhales it. Thus, in New York city, prior to 1850, although foul sewers and insanitary conditions existed, there was no diphtheria; but in the decade following 1850 the disease was introduced. Its germ made its way into the sewers underground, and now wherever sewer-gas escapes into the domiciles of the city it carries with it the diphtheritic virus. The amazing vitality and power of propagation of the diphtheritic poison are apparent when we reflect that it has permanently infected the New York sewers; so that children in all parts of the city are constantly falling ill with the disease, contracted by inhaling sewer-gas, which, notwithstanding "sanitary plumbing," often escapes from unsuspected sources. It is chiefly by exposure of children to the emanations from this widely extending culture-bed, and to walking cases, often so mild that there is little or no complaint of the throat or impairment of the general health, that diphtheria is so prevalent in New York. The diphtheritic virus is so subtle, and its vitality and power of propagation so great, that when it is once established in a sewered city the disease can probably never be stamped out, as cholera and yellow fever can.

Diphtheria is commonly communicated by the inhalation of air containing the specific principle of the disease, from whatever source the latter may be derived. More rarely the contagion is derived by direct contact with some infected solid substance, such as a particle of the diphtheritic exudate, muco-purulent secretion from an infected surface, or the blood of a patient. Observations are also accumulating which show that diphtheria, or disease closely resembling it, occurs among animals, and is sometimes communicated from them to man. The feathered tribe especially appear to be susceptible to this disease. Having described the introduction of diphtheria into the island of Sciathus, off the coast of Greece, apparently by means of some turkeys brought from Salonica, he quoted M. Menzie's authority for the statement that the disease is common among the poultry of Italy, and mentioned that a number of instances in which diphtheria appeared to be transmitted from animals to man were given in a paper by Dr. Delthil published in Paris in February, 1889. He next referred to instances in which it was apparently communicated by pigeons and fowls, as reported by Dr. F. F. Wheeler in the *American Practitioner and News* and Dr. George Turner in the *Journal of Laryngology and Rhinology*.

He then spoke of experiments by different observers which would seem to show that diphtheria can be transmitted from man to animals, and stated that if this were true, it could be inferred that it might likewise be transmitted from animals to man. Such observations and experiments, he went on to say, render it probable that genuine diphtheria, equally fatal, and attended by the same symptoms and anatomical characters as in man, does occur in birds, whether wild or domesticated, and in certain quadrupeds, as the rabbit. Nevertheless, it should be added that certain eminent pathologists, among them Virchow, have doubted the identity of animal and human diphtheria.

With our present light upon the subject, he thought it was evident that, since our relations to the domestic animals are so close, if they are sick with any disease resembling diphtheria the same precautionary measures should be taken to prevent infection of the family as in human diphtheria. Milk is a culture-medium of various microbes, and that it may be the medium of communication of diphtheria, as well as of scarlet fever, seems

probable. In this connection Dr. Smith referred to several instances of such apparent communication observed by different writers.

The fact that the diphtheritic virus may be conveyed long distances without losing its power is now admitted from the many observations that have been made, and the statistics given by Prof. C. W. Earle, of Chicago, in his paper on this subject before the Ninth International Congress, render it probable that the diphtheritic infection is not infrequently transmitted over long distances to salubrious rural localities by means of articles of clothing and merchandise.

Prevention. As regards the small extent of the area of its contagiousness and the persistence and highly infective character of its virus within that area, diphtheria resembles scarlet fever, and is unlike measles and pertussis, the specific principles of which, although they have a wider contagious area, are more volatile and more quickly dissipated. The most efficient method of preventing the propagation of diphtheria is the isolation and disinfection of patients, the prompt and thorough disinfection of the apartments in which they have been treated, and of the bedding and furniture of these apartments, and the exclusion or prevention of all noxious gases. Dr. Smith thought there was reason to believe that disinfection, as commonly practised, is inadequate, and in illustration he referred particularly to an epidemic of diphtheria occurring at the New York Infant Asylum in the spring of 1888. In the vacated ward forty pounds of sulphur, or two pounds to the 100 cubic feet, were burned until it was consumed; yet after the fumigation cultures made from dust derived from the floor and bedding produced a large number of microbes, among which Drs. Prudden and Cheeseman were able to distinguish the *streptococcus pyogenes*, identical in form and appearance with the streptococcus which they had previously discovered in two fatal umbilical phlegmons which had occurred in the ward in connection with diphtheria. Although more sulphur was used than is recommended and employed by the New York Board of Health, and in the manner recommended by the Board, it was inadequate to destroy the microbes.

It was evident that some more efficient mode of domiciliary disinfection was required, and Dr. Smith applied to Dr. E. R. Squibb, the eminent chemist, of Brooklyn, to obtain his views on the subject. Dr. Squibb wrote that, in our present state of knowledge, all that could be said in regard to sulphur fumigation against infectious material was that it is of doubtful efficacy, with the weight of the highest authorities in bacteriology against it. But to this it must be added that it is still largely used by very intelligent bodies in large institutions, boards of health, etc., where it would not be likely long to maintain an unearned confidence. Dr. Squibb believed that many of the recent failures with sulphur fumigation might, perhaps, be due to the fact that the fumes were applied dry, while formerly, when sulphur was burned in a closed chamber as a disinfectant, the surfaces were all wetted and the pot of burning sulphur was set in water or wet sand, that the heat might evaporate off a constant supply of watery vapor. These conditions, he said, were now frequently, if not generally, neglected, and where this was the case failure on principle should be the rule. Nearly all, if not all, chemical disinfectants are in a state of tension, ready to change on coming in contact with the matter to which they are applied, and these changes are either by oxidation or deoxidation; while the moment of greatest power or activity is the moment of change, when, by reacting on infectious matter, they pass from a state of tension to a state of rest under new relations. The agency through which these changes almost invariably become operative is the vapor of water. When sulphur is burned in a closed chamber, the dioxide is formed by condensing two molecules of oxygen from the air upon each molecule of sulphur, and the result is a heavy gas, which tends to settle at the bottom of the chamber and to run out through the lower cracks. Any moisture present is at once seized by the rather inactive anhydride, first forming sulphurous acid, and then, by oxidation from the air, sulphuric acid. It is during these changes that its power is exerted. If no moisture is supplied to the burning sulphur, that present in the air and on the surfaces of the chamber will soon be used up, and the dry gas remain in a comparatively inactive, inefficient condition. The anhydride will necessarily destroy all organisms which breathe in any degree, because breathing surfaces are moist. But in embryonic life protected by shell, as in seed, if the shell is dry, the gas will be impotent. Many bacteriologists have admitted that burning sulphur will kill bacteria, but not germs.

In commenting on this communication of Dr. Squibb, Dr. Smith said that it seemed probable that the apparent negative result of burning sulphur in the ward, as above stated, was due to the absence of moisture, since it was burned dry. In order to destroy the specific principle of diphtheria, Dr. Llewellen Eliot recommended, during the continuance of a case, the constant evaporation of turpentine over a water-bath. Dr. Smith said he had employed the following prescription for the purpose of disinfection during his attendance on cases, with apparently so good a result that he felt encouraged to continue its use:

℞.—Acid. carbolici } . . . āā f℥j.
Ol. eucalypti }
Spts. terebinth. . . . . f℥vj.—M.

Of this two tablespoonfuls are added to one quart of water, and the mixture placed in a shallow pan with broad surface. It is to be maintained in a constant state of simmering in the room occupied by the patient.

He next described the disinfection carried out some years ago by Prof. R. Ogden Doremus, in the wards of Bellevue Hospital, where pyæmia had been prevalent, by means of chlorine gas freshly set free; and then went on to say that diphtheria would continue to spread and largely increase the aggregate of deaths, unless stringent measures were employed to prevent its propagation by mild walking cases. He had, in a number of instances, seen children with diphtheria sitting among other children in the clinics at Bellevue Hospital, and had, in many instances, traced the disease directly to the schools, where one or more of the children had complained of sore throat. He saw no way to prevent its propagation by these mild cases except by enforced inspection and surveillance of children by parents, nurses, and teachers. Wherever diphtheria was at all prevalent, children who had the least sore throat should be excluded from the schools and compelled to remain at home.

In order to adopt adequate preventive measures the

fact should also be recognized that third persons who have had no diphtheritic symptoms themselves and infected apparel or furniture may be the medium of communication. After referring to several recorded instances of this kind, he said that nurses and physicians attending diphtheritic patients should avoid so far as possible the infection of their persons and clothing. Physicians in examining the fauces of children with diphtheria were very liable to receive upon their faces or clothes particles of the pseudo-membrane or infected muco-pus ejected by the violent cough excited by the examination. This might, to a considerable extent, be prevented by standing on one side during the examination, but he himself constantly carried corrosive sublimate with him, and washed his face and hair with a solution of it before leaving the apartment if he suspected that he had received any particle of the infectious material upon his person. Physicians thus exposed should also make use of precautionary measures in their subsequent visits to other children.

In conclusion, he referred to the paper read by Dr. A. Caillé before the New York Academy of Medicine in January, 1888, on the prevention of diphtheria, in which he stated that occasionally children had a recurrence of diphtheria each spring or autumn. Thinking that such children might perhaps harbor or carry with them the germ of the disease, he selected eight children having a permanent residence who had had repeated astacks of diphtheria, and subjected them to prophylactic treatment. All carious teeth were extracted or filled, and the mouth was rinsed after each meal with a solution of potassium chlorate, sodium chlorate or sodium borate. The solution was also gargled and injected or drawn through the nostrils. With this treatment the children had escaped the customary diphtheritic attacks during the two years that had elapsed since it was commenced.

CORRESPONDENCE.

THE CLINICAL APPLICATIONS OF BARIUM AND OF STROPHANTHUS.

To the Editor of THE MEDICAL NEWS,

SIR: When the defendant in a suit fails to appear, either in person or by attorney, judgment is taken by default, and great difficulty attends upon attempts to reopen the case. In the issue of this journal for February 23d ult., Prof. Bartholow has taken exception to the article of Dr. Hare, relating to the clinical applications of barium, claiming that he is entitled to some credit for its introduction and use upon this side of the Atlantic. While not necessary as a defence of the claims of Prof. Bartholow, it may be interesting to know what he taught concerning this remedy as early as the winter of 1881, and I take pleasure in reproducing from my note-book an extract of his remarks.

"The use of barium in medicine is a capital illustration of the advantages of scientific investigation as compared with empiricism. It (barium) has an acrid, styptic taste, and produces a flow of saliva and the stomach juices; in toxic doses it acts as an irritant poison. It increases the peristalsis and acts upon the nervous system; it slows the heart and its contractile power is largely increased. This is effected by the stimulation of the vaso-motor nerves, but when too long continued it may cause rigidity and tetanus, followed by paralysis. The pupil is dilated, this being due to stimulation of the radiating fibres of the iris.

"Therapeutics: It was first considered to be an alterative, but does not belong in this category. It has been used in aneurism, with or without Tufnel's method, and as it acts more energetically than ergot, it can be employed in arresting active hemorrhage, in the early stages of inflammation (the stage of congestion), in paresis of the bladder and in weak heart."

Like Prof. Bartholow, I feel that my efforts relating to strophanthus and its clinical applications have been overlooked in the course of your editorial in the same number. If you will refer to the issue of this journal for February 4, 1888, it will appear that I have already filed a caveat in the following words: "And I venture the prediction that its (strophanthus) value as a therapeutic agent will be greatly extended when it becomes more generally known." Admitting the high standing and great reputation of those to whom you refer, I am not willing that it should be understood that all of our knowledge of the clinical application of drugs comes from abroad. My prediction was based upon the results of clinical observation, and the experience of others, as well as my own work, goes to show that the favorable opinion was fully warranted.

Within the past year numerous references have appeared from time to time in THE MEDICAL NEWS, but for the most part, the authors have been foreigners, a fact which is not to the discredit of the remedy nor the writers, but it implies a lack of that spirit of investigation, which is so characteristic of our American people, and fails to do them justice. Neither the physicians nor the surgeons of this country are behind their trans-Atlantic brethren in enterprise, but the opportunities here for investigation are less numerous, and as a result, the work that demands attention on the spur of the moment is often marked by evidences of haste. Time will remedy these defects, and show that American citizens are entitled to take the lead in every department of medicine and surgery, and the references in our journals to foreign authors will be the exception rather than, as now, the rule.

JOHN AULDE, M.D.

PHILADELPHIA, March 23, 1889.

[The editorial to which our correspondent takes exception explicitly stated that it only referred to discussions which had taken place in the medical societies "within the *past few weeks*," and, therefore, his observations, which were published a whole year before, were of course not included.—ED.]

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